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No. 283



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WORLDWIDE REPORT  
ENVIRONMENTAL QUALITY

No. 233

## CONTENTS

PAGE

## WORLDWIDE AFFAIRS

Briefs		
International Environment Preservation Seminar		1
ASIA		
AUSTRALIA		
Briefs		
Radioactive Waste Management		2
INDIA		
One-Third of the Country Hit by Drought (G.K. Reddy; THE HINDU, 5 Nov 79) .....		3
Apathy Towards Drought in Bihar (THE STATESMAN, 2 Nov 79) .....		5
Briefs		
Drought Situation Discussed		7
INDONESIA		
High Levels of Water Pollution at 17 Locations (KOMPAS, 8 Oct 79) .....		8

**CONTENTS (Continued)****Page****JAPAN**

- Consumer Groups Step Up Campaign Against Synthetic Detergents  
(Hidesuke Nagashima; KYODO, 13 Nov 79) ..... 10

**EAST EUROPE****BULGARIA**

- Scientist Expresses Concern About Growing Erosion, Pollution  
(Velin Koynov Interview; OTECHESTVO, 28 Sep 79) ..... 13

**CZECHOSLOVAKIA**

- Needs of Economy, Ecology Must Be Reconciled  
(Miloslav Hudec Interview; PRAVDA, 4 Oct 79) ..... 19

**LATIN AMERICA****ARGENTINA**

- Spread of Contamination Forces Chemical Plant Shutdown  
(LA NACION, 20 Oct 79) ..... 24

**Briefs**

- Skin Disease Detected ..... 26

**CUBA****Briefs**

- Conservationist Meetings ..... 27

**VENEZUELA****Briefs**

- Mercury Contaminates Fish ..... 28

**SUB-SAHARAN AFRICA****BOTSWANA**

- Acute Water Shortage at Lerala Village Reported  
(Lentlhabile Maano; DAILY NEWS, 18 Oct 79) ..... 29

**Briefs**

- Water Shortage Hits Kweneng  
Tswapong Gets Showers ..... 30

## CONTENTS (Continued)

Page

## NAMIBIA

Source of Arsenic in Klein Windhoek River Unknown  
 (THE WINDHOEK ADVERTISER, 20 Nov 79) ..... 31

Cause of Klein Windhoek River Pollution Under Study  
 (THE WINDHOEK ADVERTISER, 21 Nov 79) ..... 32

## USSR

## USSR

'Biosfera' Research Vessel  
 (Z. Aleksandrova; NEDELYA, No 39, 1979) ..... 33

Amur River Conservation Measures Stressed  
 (A. Akulinchev; TRUD, 11 Oct 79) ..... 34

The Problem of Industrial Pollution in Armenia Examined  
 (L. Alaverdyan; KOMMUNIST, 10 Oct 79) ..... 38

Text of RSFSR Decree on Environmental Protection Measures  
 (SOBRANIYE POSTANOVLENIY PRAVITEL'STVA ROSSISKOY SOVETSKOY  
 FEDERATIVNOY SOTSIALISTICHESKOY RESPUBLIKI, No 10, 1979) .. 43

Measures Undertaken for Prevention of DNEPR River Pollution  
 (V. M. Ropot; SOVETSKAYA MOLDAVIYA, 14 Sep 79) ..... 52

Installations for Protection From Floods Built in Leningrad  
 Area  
 (D. Aleksandrov; EKONOMICHESKAYA GAZETA, Oct 79) ..... 54

Measures To Check Moscow Air Pollution Described  
 (MOSKOVSKAYA PRAVDA, 1 Sep 79) ..... 59

Minsk Purification Complex in Operation  
 (A. Vysotskiy; IZVESTIYA, 10 Oct 79) ..... 61

Shortcomings of Kiev Campaign Against Air Pollution by Motor  
 Vehicles  
 (A. Geletko; RABOCHAYA GAZETA, 27 Oct 79) ..... 63

Using Chemical By-Products Instead of Disposing of Them  
 (V. Rykov; IZVESTIYA, 21 Oct 79) ..... 65

CONTENTS (Continued)	Page
Treatment and Utilization of the Waste Produced in Oil Refining (A. Yershov; IZVESTIYA, 12 Oct 79) .....	69
Shortcomings in Training of Engineers (EKONOMICHESKAYA GAZETA, Oct 79) .....	74
<b>Abstracts</b>	
VECHERNIY LENINGRAD, 9 Oct 79.....	77
<b>Briefs</b>	
Noise Abatement Measures	78
Wastewater Treatment by Combines	78
Environmental Damage by Construction	78
Polymer Filtering Powder	79
Vil'nyus Environmental Measures	79
Bonuses for Environmental Protection	79
Space Photographs Aid Oil Pollution Study	80
 WEST EUROPE	
<b>CYPRUS</b>	
Government Swamped by Environmental Protest (THE CYPRUS WEEKLY, 12-18 Oct 79) .....	81
<b>TURKEY</b>	
Copper Mining Facilities Endanger Environment (CUMHURIYET, 22 Oct 79) .....	83
Municipality Implements New Plan for Bosphorus (MILLIYET, 23 Oct 79) .....	88

WORLDWIDE AFFAIRS

BRIEFS

INTERNATIONAL ENVIRONMENT PRESERVATION SEMINAR--Sofia, October 1, (BTA)--  
An international symposium was opened here today, which will discuss the  
problems related to the distant transference of pollutants in the atmosphere.  
More than 100 specialists from Austria, Great Britain, the GDR, the FRG,  
Denmark, Spain, Canada, Norway, Poland, the USA, the Soviet Union, Hungary,  
Finland, France, the Netherlands, Czechoslovakia, Switzerland, Sweden,  
Japan and Bulgaria have been invited to participate. [Text] [Sofia BTA  
in English 1345 GMT 1 Oct 79 AU]

CSO: 5000

AUSTRALIA

BRIEFS

RADIOACTIVE WASTE MANAGEMENT--Canberra, Nov 13--A program of radioactive waste management has been completed at the Monte Bello Islands off the northwest coast of western Australia, the minister for national development, Mr Kevin Newman, said today. The islands were the site of nuclear weapons tests carried out by Britain in 1952 and 1956. A report by the Australian Ionising Radiation Advisory Council (AIRAC) presented to parliament today said: "It is difficult to imagine that a casual visitor could now come to any harm." Mr Newman said multi-lingual signs conveying radiation hazard warnings advising against permanent occupation has been erected. "To the extent practicable, areas in the immediate vicinity of the on-shore test sites have been cleared of radioactive debris and residual structures," he added. [Text] [OW140233 Hong Kong AFP in English 0723 GMT 13 Nov 79 OW]

CSO: 5000

ONE-THIRD OF THE COUNTRY HIT BY DROUGHT

Madras THE HINDU in English 5 Nov 79 p 9

[Article by G.K. Reddy]

[Text] New Delhi, Nov. 3. About one-third of the country, with nearly one-quarter of the population covering roughly 35 percent of the districts, has been affected by drought which has created near-famine conditions in the worst hit parts of several States.

Though the official estimates are that the shortfall in the current Kharif crop production would be in the range of 12 million tonnes, the agricultural experts fear that it might be as high as 16 million tonnes from last year's 78 million tonnes.

The Government is pinning its hopes on a better rabi crop to narrow the gap to within manageable limits, so that the economy does not suffer any serious damage in the wake of the 25 percent inflation. The economic advisers are not taking too pessimistic a view, because the present situation is not without its silver lining, despite the widespread distress caused to the poorer sections of people.

The drought, it is pointed out, would help the Government put in the market at least four to six million tonnes out of the 20 million tonnes of buffer stocks of foodgrains. It would bring in between Rs. 500 to Rs. 650 crores at the existing prices and go a long way in reducing the staggering budgetary deficit to some extent. It would also reduce the amount of loose cash in circulation.

But then this marginal gain is going to be achieved at the fearful cost of losing Rs. 1,500 crores to Rs. 2,000 crores through an anticipated fall of 12 to 16 million tonnes in kharif production. This fall in food output followed by the decline in industrial production as a result of power shortages, labour unrest, scarcity of essential raw materials, transport bottlenecks and wrong policies of the Government, could create a politically explosive situation in the country on the eve of the elections.

The Government expects the economic pressure to ease a bit during the next few weeks through increased availability of power for stepping up production, the promise of a better rabi crop and perhaps also improved distribution of essential commodities for holding the price line wherever possible. But the labour situation continues to get worse with no sustained effort at the higher political level to meet reasonable demands of the moderates before the extremists start dictating their terms from entrenched positions.

The top leaders of the Caretaker Government are not displaying either the will or the capacity required for coping with this unprecedented situation at a politically awkward moment. The bureaucracy is tending to play safe, displaying no special zeal for taking timely action for regaining the lost initiatives of various levels of the Government. There is no sign of any single-minded determination either at the political or administrative level, to come to grips with the many baffling problems facing the country, whether it is in dealing with law and order or in economic management.

There is a strange feeling of drift these days in almost every sphere of governmental activity, whether in relation to price increases, drought relief, prevention of strikes or disaffection of the police. And amidst the increasing preoccupation with the coming elections, the major problems of the day are not receiving the due attention of the Government which, in any case, is inhibited from taking any major decision.

CSO: 5000

APATHY TOWARDS DROUGHT IN BIHAR

Calcutta THE STATESMAN in English 2 Nov 79 p 1

[Text] Ranchi, Nov. 1--The elections seem to have come as an excuse for politicians and the State bureaucracy in Bihar to ignore the gravity of the drought situation. Concern was expressed in the preceding months by Ministers and officials over the severity of the drought. But steps to fight the situation, including relief operations in the drought-hit areas were kept at a standstill as the officials waited for the Hathia rains.

The officials advised the Government to follow the conditions laid down in the famine code before launching relief operations or even making any official pronouncement.

Scattered rainfall in parts of the State marked the end of Hathia on October 8. The scanty rain during Hathia changed the official thinking. It was stated that more than 60% of the standing kharif crop could be saved.

Ironically, conditions in the villages speak otherwise. In low-lying areas, while the expected yield is put at 50% in higher lands which constitute a major part of the total cultivable area, the damage is between 70% and 80%. The total crop loss in Bihar, according to estimates, has been put at 60%.

While States like Uttar Pradesh, Rajasthan and Madhya Pradesh have declared a drought in the affected districts, no official announcement on the drought has been made in Bihar. The only official gesture shown to farmers has been uninterrupted power supply to farms for five hours a day for a fortnight ending on November 5. This is to save the crops where irrigation is assured. Only one-fourth of the total land comes under assured irrigation in Bihar and the figure for the Chotanagpur and Santhal Parganas region is, accord'ng to official statistics, only 3% of the total land in the region that comes under irrigation.

Reports from different parts of the State indicate that the Government's claim that it has ensured uninterrupted power supply for irrigation by rationing the supply to urban areas and industries is not true. Only some parts of the State are getting power with many interruptions. In a large number of villages, energized pumps and wells do not operate. The condition of marginal farmers and landless farm workers is pitiable.

According to the blueprint prepared by the Government, a massive food-for-work programme will be launched from the middle of October in the drought-hit areas. Distribution of free ration to at least 1% of the population in the affected areas is envisaged. Old-age pension will be given to the poor and destitute in villages. Rabi sowing will be advanced and more areas will be brought under rabi cultivation.

Meanwhile, there has been a steady rise in the migration of labourers and marginal farmers from the Chotanagpur region to the neighbouring States in search of food. About 4,000 villagers from Ranchi and Palamau districts are reported to have gone to work in the Singrauli coal project in Madhya Pradesh.

While Opposition leaders belonging to the Congress (I), Lok Dal, Congress and Communist parties are busy drawing up poll strategies, the State leadership is overshadowed by a powerful bureaucracy which is trying to underplay the drought situation, Janata leaders in Bihar seem to be equally indifferent.

CSO: 5000

INDIA

BRIEFS

DROUGHT SITUATION DISCUSSED--The Cabinet committee on drought is meeting in New Delhi today to review the situation and to provide further guidelines to tackle the problem. It will be presided over by the deputy prime minister, Mr Y. B. Chavan. The union agriculture minister has also convened a meeting of chief engineers of drought-affected states on Saturday to discuss steps to improve drinking water facilities in the affected areas. Meanwhile in Bihar, 296 blocks, that is more than half of the total number of blocks in the state, have been declared famine-hit areas. Damage to crops in all such blocks has been more than 50 percent. An official spokesman said in Patna that the state cabinet, which reviewed the unprecedented drought situation, has decided to declare the whole of Nalanda, Hazaribagh, Dhanbad, Giridih, Begusarai, Palamau, Singhbhum and Ranchi as famine-hit areas. [Text] [BK230920 Delhi Domestic Service in English 0240 GMT 23 Nov 79 BK]

CSO: 5000

HIGH LEVELS OF WATER POLLUTION AT 17 LOCATIONS

Jakarta KOMPAS in Indonesian 8 Oct 79 p 12

[Excerpts] Critical or serious levels of water pollution are found in at least 17 cities or locations in Indonesia, among which the pollution level has reached far above the minimum standard of water quality required of developing countries by the World Health Organization. This despite the fact that the standard has been greatly lowered as compared with that for developed countries.

The above finding was divulged by Dr RTM Sutamihardja of the Center for Studies of Natural Resources and Environment, Institute of Agriculture, Bogor, on the basis of his research.

The 17 [sic] locations or cities are Medan, Asahan region, Pekanbaru, Palembang, Jakarta, Bandung, Cirebon, Cilacap, Semarang, Yogyakarta, Surabaya, Denpasar, Pontianak, Banjarmasin, Balikpapan, Samarinda, Ujungpandang and Soroako.

According to Dr Sutamihardja, there are two main sources of pollution, namely, industries and households. Industrial pollution can be contained by installing water purification equipment in factories, although at present only a few factories have such installations. However, the pollution from households and the community depends very much on public consciousness.

He cited a study made by Ir. Bian Poen of the Jakarta Special Municipality which showed that among the 700,000 Jakarta households studied, only 160,000 have septic tanks and not all of these tanks meet the requirements. The remaining 540,000 households simply dump their waste into the rivers, although the water level of the rivers is gradually becoming lower.

The city of Jakarta dumps 10,000 cubic meters of household and public garbage every day. Of this amount, only 4,700 cubic meters can be disposed of by government service, while the remainder is handled by the inhabitants themselves who mostly throw the refuse into the rivers.

Dr Sutamihardja said that such cases indicate the dangers of the situation. He estimated that within the next 5 years pollution from households and the community, along with industrial pollution, will result in greater funds needed to supply running water for Jakarta. Various stomach ailments of endemic nature caused by water are likely to occur.

He pointed out that already small towns have begun to notice the pollution of rivers there, due to--besides the low sense of awareness among the inhabitants--erection of industries along the rivers in order to minimize production costs. This represents a problem of land utilization which has not been resolved.

According to Sutamihardja, we should pay special attention to rivers situated in the Jabotabek region (Jakarta, Bogor, Tangerang, Bekasi) and especially the Ciliwung River in Jakarta and Cisedane River in Tangerang, Garang River in Semarang, Cikapundung River in Bandung and Musi River in Palembang. As a matter of fact, he said, the pollution of rivers in Jakarta has collected 10 to 100 times more filthy sediment than is tolerated by World Health Organization standards.

9300

CSO: 5000

## CONSUMER GROUPS STEP UP CAMPAIGN AGAINST SYNTHETIC DETERGENTS

Tokyo KYODO in English no time given 13 Nov 79 OW

[Article by Hidesuke Nagashima]

[Text] Tokyo, 13 Nov KYODO—Which is more important, clear water or convenience in washing?

That question faces millions of Japanese living in lake or seaside regions, as a ban on synthetic detergents containing phosphates goes into effect next April in Shiga Prefecture, Western Japan, to preserve water quality in Lake Biwa, Japan's biggest freshwater lake.

The problem with synthetic detergents is that most of them contain phosphates.

Phosphates in household waste water from washing machines or kitchen sinks, discharged into a body of water, cause a reddish discoloration of water, known as red tide, through the abnormal growth of planktons. The process is known as eutrophication.

There already exist non-phosphatic detergent formulas in the United States, developed by Procter and Gamble in the wake of a ban on phosphatic detergents in states on the five Great Lakes. In washing performance, they are poorer than regular detergents but still better than powder soaps.

The Shiga prefectoral assembly on October 16 approved a special anti-eutrophication ordinance banning the sale or use of all phosphatic detergents in the prefecture effective next April 1. It also bans the giving of such detergents to prefectoral residents by any persons. Violators are subject to fines of up to yen 100,000.

The action has prompted growing moves among conservationists in other lake and seaside regions in Japan to seek similar measures.

Eutrophication by phosphates affects not only lakes but also rivers and sea bays. The problem is naturally more serious, however, in lakes without direct communication with the sea.

Conservationist campaigns for a ban on synthetic detergents are already under way in communities on Lake Kasumigaura, northeast of Tokyo; Lake Suwa, central Honshu; and the Inland Sea in western Japan.

Local government authorities in the areas, however, are less than enthusiastic about such a ban, saying it's up to the consuming public to switch from detergents to powder soaps.

Meanwhile, the Japan soap and detergent manufacturers association in Tokyo, feeling a serious threat to detergent business from the growing campaigns, says it is ready to wage a court battle against the ordinance on grounds it imposes unfair restrictions on commercial rights. A spokesman says, however, no specific schedule has been set for instituting legal action.

The question seems to boil down to whether the public is ready to put up with some inconvenience in the interest of conserving nature.

In Shiga Prefecture, consumer campaigns against detergents have been under way for several years following widespread reports blaming them for water pollution in Lake Biwa, the source of drinking water for 12 million people in western Japan.

A survey by prefectoral authorities indicates that more than 80 percent of the residents support a ban on synthetic detergents and close to 40 percent have actually switched from detergents to powder soaps.

An average 2.3 tons of phosphates flow daily into the lake--674 square kilometers in area and 96 meters in depth--and synthetic detergents account for 18 percent of that, according to an official investigation.

Gov Masayoshi Takemura notes that the ban on detergents has come about as a result of 'people's love of their native province,' including the Lake Biwa quasi-national park.

Despite its approval by the prefectoral assembly, the measure faces some uncertainty.

A rider to the measure, attached through active lobbying by the soap and detergent manufacturers association, calls for its 'careful application' for one year. It is obviously intended to water down the measure at least temporarily.

At the same time, the association has been running TV commercials and newspaper ads stressing the convenience of phosphatic detergents.

In countering the consumer campaigns, the association blames inadequate sewer systems in Shiga Prefecture, rather than detergents, on water pollution in Lake Biwa.

Noting that only 4.1 percent of the homes in the prefecture are served by sewers, the association says a ban on detergents would not stop water pollution.

While consumer groups are stepping up their campaigns against detergents in other lake and seaside districts of Japan, local government authorities are taking a wait-and-see attitude.

In Tsuchiura, a city on Lake Kasumigaseki, there have been campaigns against detergents but the public generally has remained indifferent, perhaps because only 150,000 to 160,000 people in southern Ibaraki Prefecture receive drinking water from the lake, in contrast to 12 million people served by Lake Biwa.

Prefectural officials expect difficulty in legislating a ban on detergents.

Local authorities are likewise noncommittal about consumer groups' demands for such a ban in areas along the Inland Sea coast and the Yodo River in Osaka.

CSO: 5000

SCIENTIST EXPRESSES CONCERN ABOUT GROWING EROSION, POLLUTION

Sofia OTECHESTVO in Bulgarian No 18, 28 Sep 79 pp 8-10

[Interview with Prof Velin Moynov, honored scientist, place and time not indicated, by Vessela Dzharekarova: "Evil Forces on the Offensive and Defensive"]

[Text] Problems about the earth are as old as the earth itself. They appear and disappear following a certain succession of their own. They are least amenable of all to solution in writing. Proceeding on paper is one thing; on mother earth it is something else!

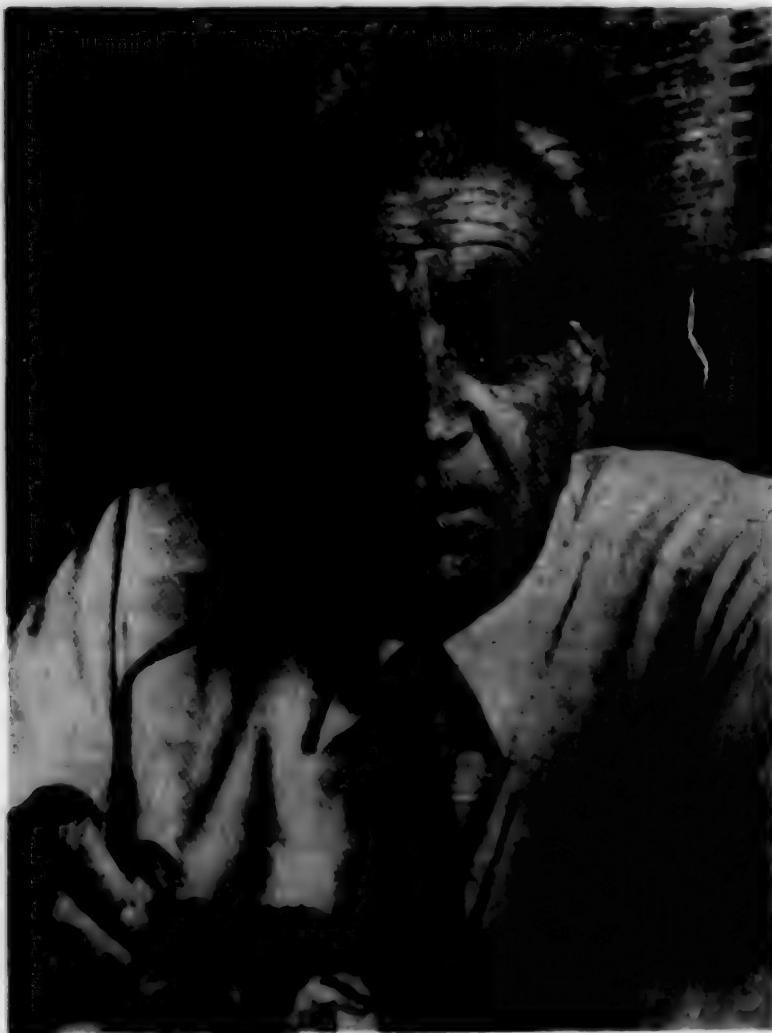
On paper it is said, for example, that the Bulgarian "cares" for his land --but this does not prevent him from continuing to be unkind and prone to irresponsibility towards one of the most valuable national resources. Frequent repetition of this truth runs parallel with the enactment of ordinances, orders and decrees aiming at restraint on the plundering and at more concern for the land. But the world of practice often proves indifferent to truths, on the one hand, and nonobservant of laws, on the other.

Aware of this in advance, we requested one of our most outstanding soil scientists, corresponding member of the Bulgarian Academy of Sciences and honored scientist, Professor Velin Voynov, to share with the readers of OTECHESTVO the fears and predictions that he, as a specialist, has concerning the protection of the earth and of environment-sensitive soils. The professor has taken a very active part in compiling a soil map of the country on a scale of 1:200,000; has studies a number of irrigation facilities; has directed wide-scale soil research resulting in the creation of a soil map on a scale of 1:400,000; and has participated in compiling a soil map of Europe on a scale of 1:1,000,000 through the FAO (UNESCO), and in a number of other worthwhile economic and scientific undertakings.

[Question] Professor Moynov, we are convinced of our land's fertility. That is its traditional characteristic. But how are we to protect it against the inroads of people, winds and rains acting as "evil forces"?

[Answer] The question is of paramount economic and national significance owing to the small amount of arable land per capita of our population. Moreover, the population is constantly increasing, while the land remains the same! To be more precise, in the last 15 years--up to the beginning of 1975 --arable land decreased by about 1.4 million decares while nonarable land increased by more than 4.2 million decares.

Thirty years ago there was an average of 8 decares of arable land per inhabitant; today there is barely 5.6.

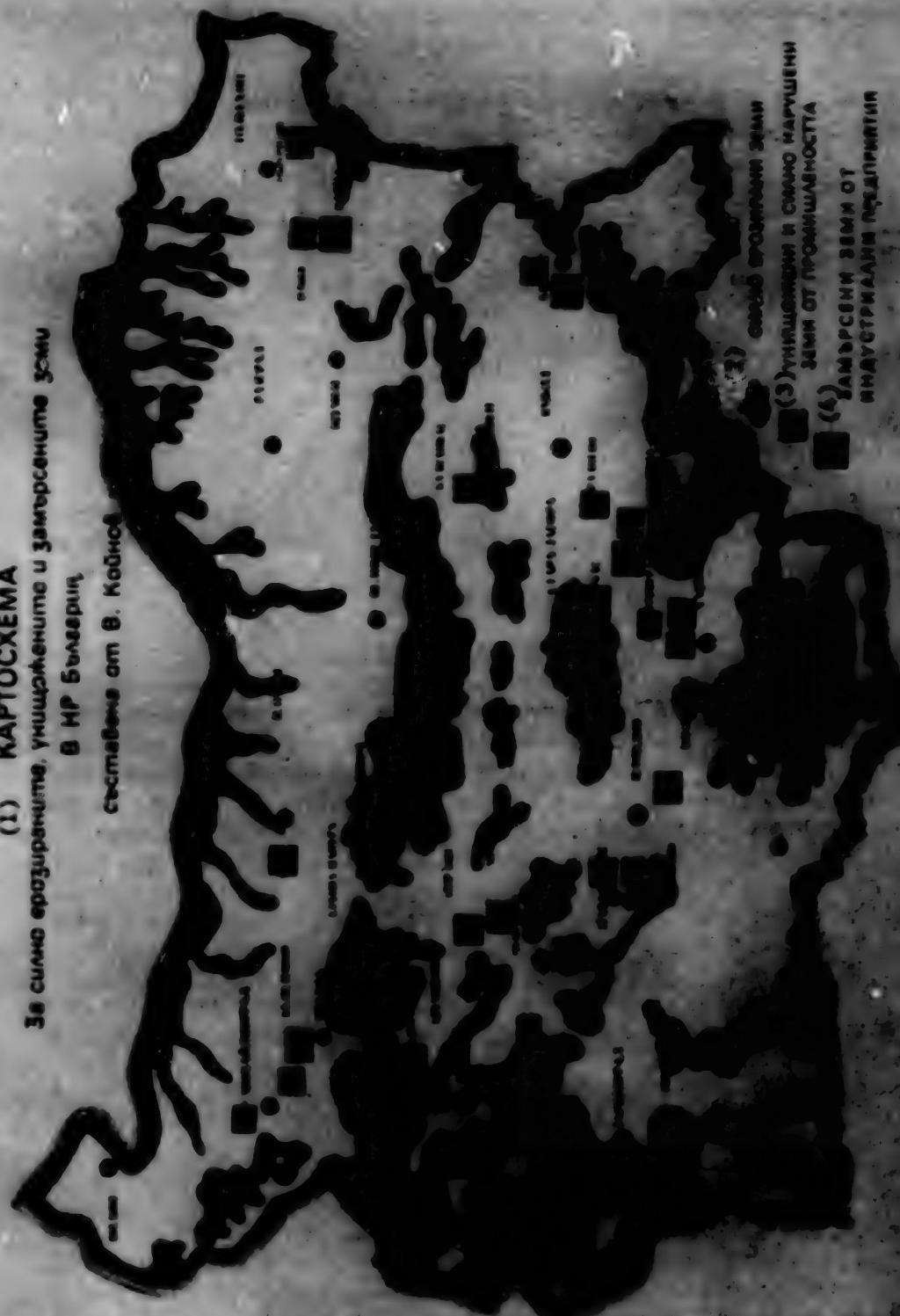


Professor Velin Koynev

## (1) КАРТОСХЕМА

За също огражданите, унищожените и замърсаните земи  
в НР България,

составени от В. Коидов



**Key to Map:**

1. Diagrammatic map of severely eroded, depleted and polluted land in the Bulgarian People's Republic, compiled by V. Koynov
2. Severely eroded land
3. Land depleted and severely impaired by industry
4. Land polluted by industrial enterprises

[Question] Where are depleted, impaired or polluted lands most abundant?

[Answer] In the Eastern Rhodopes, in the Struma valley, in the Sakar Planina, in the (Dervenski) Hills, on the southern slopes of the Strandzha, in the Krayishte [border region]. . . Generally speaking, we rank among the first in Europe in soil erosion. Over 50 percent of the country's total area is subject to erosion. Every year over 5 million tons of fertile soil are lost because of this process; this is 1.2 million tons of humus substances, equal to hundreds of thousands of tons of chemical fertilizers. Erosion has reached such proportions that protecting our soil resources against it must be regarded as problem No. 1 of our entire agricultural and forestry practice! The rate of afforestation and other "measures" do not match the rate at which erosion is developing.

\* \* \*

For Professor Koynov the motley-colored map in front of us was a living, quivering organism, at which he peered intently, unable in a short time to communicate its infinite qualities and shortcomings. I barely had time to jot down the figures that speak more eloquently than even the most infectious appeals and programs. . . What doesn't threaten the land? In the words of our guide we might give priority to certain "adverse changes" hanging over our placid lives which are not remotely alarmed about the soil. For we look at the land from afar, as a landscape or a problem possessing literary, rather than real value. We know that it will not let us go hungry. . . The land did not come into being yesterday!

But let us round out the picture . . . with land no longer in cultivation. It simply forces itself upon our attention, but the esthete prefers to turn his back on it and forget it since it suggests thoughts of desolation and the end. . . What else? By the end of operations at the Maritsa-East open-pit mine approximately 300,000 decares will be impaired, with a total of over 200,000 decares of land already affected up to now by the coal and mining industry. And certain reliable data indicate that by the year 2000 approximately another 2.2 million will be eliminated . . . for construction sites, reservoirs, canals, roads. What happens then?

"I wonder," Professor Koynov is baffled. "There are many obvious and disagreeable cases of wastefulness, thoughtlessness and irresponsibility.

Something strange happens: unproductive land is sought out for reclamation, while the most valuable land is selected for industry and construction! A number of departments neglect state interests for their local and subjective interests. But soils are the result of long years of creation and one should shrink back from using a single inch of land for nonagricultural purposes!"

[Question] The land is affected by everything. . .

[Answer] Yes, because everything gets into it. It is harmed by polluted irrigation water, polluted air and by the pesticides against the predators, diseases and weeds in cultivated plants. (Bulgaria ranks among the first in the world in pesticide use.) Only certain plants have selectivity: potatoes, for example, take up one-ninth as much pesticides as carrots. From the soil, pesticides can get into underground drinking and irrigation water.

[Question] And what is the air "to blame" for?

[Answer] The air, with huge amounts of waste products from industrial activity, is one of the important soil pollutants. Hasn't it been reported that at Maritsa-East in a 24-hour period 1500 tons of ash and 630 tons of sulfur dioxide are discharged, while over 20 tons of dust containing the same respective harmful components are discharged in a 24-hour period from the stacks of Kremikovtsi? That in the Devnya valley and in the region of the Zlatina Panega cement plant the yields on polluted cropland average about 40 percent less than those in the unpolluted surrounding regions?

\* \* \*

Yes, this is known. However, pollution would lose some of its greatest force as a problem if we did not mention the harm caused by polluted water. Professor Moynov makes this more specific: "From the use of such water alone, about 300,000 decares of irrigated cropland with impaired natural fertility were charted in 1973. Many spots in the courses of large rivers fall into the category of water unsuitable for any kind of use whatsoever. Today over 500,000 cubic meters of household sewage and 2 million cubic meters of untreated water are discharged every day into rivers. Yearly an inhabitant leaves behind him more than 200 kilograms of the most diverse household and other wastes. In relation to population numbers, these are mountains of substances containing infection, threatening the landscape and spoiling large areas of tillable soil! Over 500,000 depleted decares are attributable especially to industrial wastes."

[Question] It would seem there are no unaffected soils left in the country. . . Are we to adopt the concept of a "rubbish-heaps civilisation"?

[Answer] No, let's not exaggerate.

[Question] Is there any hope of regaining what has been lost? Can science and practice contribute to the solution of these nationwide problems only by . . . sounding alarms?

[Answer] The will to fight helps solve many problems, too. Our efforts, of course, cannot be compared with the force and benefit of a timely decree and, above all, with the organized cooperation of the entire society. Soil scientists have long studied and "inventoried" our soil resources. Today all farms have their own soil map (scale of 1:25,000), accompanied by agroindustrial characteristics. (Few countries have such a collection of maps!) By the present time all irrigated areas have been studied from a land-reclamation standpoint. Fertiliser is applied in differentiated fashion, rather than empirically as it had been earlier. In 1969 the development of an automatic system of agrochemical services began, with optimized recommendations for fertiliser application etc. Pollution studies, begun by various scientific institutes, must continue and contribute directly to changing the picture.

Let us sum up. About 75 percent of our tillable soil is subject to water erosion, and part of the Danube plain and Burgas and Yambol okrugs are subject to wind erosion. The campaign against water erosion has been conducted from time immemorial, but the organized campaign began in 1960. Up to now about 8 million hectares have been reliably protected. In 1965 the State Council entrusted the Ministry of Forests and Forest Industry and the former Ministry of Agriculture and the Food Industry (now the National Agroindustrial Union) with drawing up a national long-term program of erosion control, which program would be finally ready by the end of this year. The main thing that it promises us is the protection of all useful croplands against erosion.

So--there are hopes. But . . . hope still does not signify reality.

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CSD: 5000

CZECHOSLOVAKIA

**NEEDS OF ECONOMY, ECOLOGY MUST BE RECONCILED**

Bratislava PRAVDA in Slovak 4 Oct 79 p 3

[Interview with Engr architect Miloslav Hudec, director of the Department for Protection of Living Environment at the federal Ministry of Technological and Investment Development, by Iveta Suchova: "A Dialogue between Economy and Ecology"]

[Text] Since Karel Capek's sigh: "if all of us got together and everybody would donate one small green tree to the country around us, how beautiful it would be in 50 years from now!" an exact half century elapsed and we find that the environment in which we live was the subject of interest also for the generations before us, that it is not only a contemporary problem, although civilization progress considerably multiplied, but in a way also clarified it. While planting of trees and lawns, beautification of parks and towns was regarded as the only and the most important part of environmental protection only; a few years ago, it is science which intervenes today. With its exact and uncompromising criteria, it defines precisely what can be done by the citizens themselves and what must be done by the society because the expansion of industry, constantly increasing application of chemicals, urbanization and motorism confront the mankind with completely new and complex problems.

This was the topic which our editor discussed with Engr Hudec.

[Question] We have indicated in the way of introduction that the immense economic upswing on which the living standard depends confronts the society with a difficult ecological problem. Assembly lines pour merchandise, the stacks smoke, households are being furnished with appliances, we can afford to buy this or that except...that we breathe in ugly polluted air. Is there any relationship between the living standard and living environment?

[Answer] As late as 20 years ago, the problem of living environment was associated with the living standard and was regarded as its component. Gradually it became apparent that the living environment and the living standard were two equally important factors and one could not exist without another. Let me give you an example: if we pay a person a wage for his work, but fail to provide him with a healthy and clean living environment, in which he could spend his earnings, then a high living standard is of little value to him, when he is attacked by the basic components of the living environment.

The living standard and its increase, however, depends upon the source of raw materials, processing industries and agriculture which all combined negatively affects the living environment. For this reason, we must aim at the rational exploitation of natural resources--water, soil, forests. All this are ecological factors which affect the economy. In other words, if man wants to have a certain living standard, he must work, but in order to enjoy the fruits of his labor, he needs to live in an environment corresponding to it.

From these two, social and ecological standpoints we must approach the protection of the living environment. Political and economic conditions of our society make it fully possible and abundantly support it. The party and state documents, government executive orders, the entire legislation and articles and commentaries in the newspapers and periodicals devoted to the protection of the living environment are evidence of that.

[Question] Despite everything you have just said I would like to ask you a heretical question: is our domestic, Czechoslovak living environment a reason for a headache? In the public the opinion prevails that we are not too well off, that we have spoiled everything that was possible to spoil. Do you personally and not from the position of a director of the respective department think that the situation really looks so black?

[Answer] In the first place, I cannot split my ego into an official and civilian one. I could never work in this area, if I were not an optimist, if I would not see and feel the successes which we have achieved and which our public regards as a matter-of-course. I would like to give you some examples again: despite the constantly increasing exploitation of our country for industry, agriculture and mining, we have actually achieved something fantastic for such a small state as Czechoslovakia is (127,000 square kilometers). We confined the negative effects to certain zones and did not permit them to spread into the recreational areas--southern Bohemia, the Tatra Mountains, the Giant Mountains (Krkonose)... Yet, what has prevented us from constructing power or chemical plants in those areas? We were motivated solely by the effort to maintain the balance of the country. In other words, since we must have industry, let us keep it concentrated in certain areas. Where would the miners from the North Bohemian coal basin find recreation? And what about others?

We can regard as another success the fact that we have succeeded in maintaining the proper relationship between the production increase and the maximum potential burden that the country can bear. It actually is a continuous dialogue between the ecologist and the economist. For the time being, this dialogue is conducted on the state research level. The Trebon and Freydek-Mistek regions are the model areas as of now.

This dialogue is not always most courteous nor simple because the economist tries to find the way of the least resistance at the lowest possible costs, while the ecologist draws attention to the potential irreparable damage.

In southern Bohemia for example, gravel and sand can be removed only under certain conditions so that the administration of water resources is not interfered with.

This is a new view of the problems based on the conclusion that even the so-called clean areas cannot be exempted from the economic development. If certain production is to be started there without adverse effects, the demands of the ecologists in regard to the living environment must be taken into consideration. We call it the ecological optimization of economic development.

The third success is the implementation of the correct decision to maintain a correct structure of population density by proper distribution of industry, investment projects, housing construction. It did not happen in our country what took place elsewhere, namely that the population is concentrated in cities, while smaller towns and villages are being depopulated. Many years ago, we formulated a program dealing with the solution of this problem. The result is that, if you would ask somebody today to move from the Pelihrimov region to Prague, he simply would not go there. The reason is simple: at home he has a good job, decent housing and possibilities of cultural pursuits. Even the young Praguers do not cling to the capital as they did only a few years ago. They calmly move to the so-called countryside which slowly, but surely ceases to be different from town because it possesses all basic attributes and, in addition, nature is nearby.

[Question] What about the negative aspects?

[Answer] Unfortunately, our country does not have any refined fuels and so we quite logically encounter difficulties in protecting the environment. Even the present-day technology does not know how to burn coal without harmful substances being injected into the air and this pollutes air in the neighborhood of power generating plants. Some specific measures have been enacted: fuels are distributed according to the concentration of industry, high stacks are being built which will scatter the harmful substances over larger areas and so on. In addition, we have enacted a large body of social measures providing for schools in nature, extended vacations, recreation on the priority basis, preventive health care and so on. But the accelerated desulfurization of intensive sources of energy remains the most important problem. We have begun to cooperate with the Soviet Union in developing certain technology which seems most appropriate for our conditions. The first will be installed on the 200 MW block in Tuzimice.

Fly ash is another headache for our civilization. There are devices for catching it, but nobody seems to care for their proper operation which is blameworthy. On the other hand, many plants do not have these filters at all because they cannot be installed on obsolete equipment and even, if they could be, they are simply not available. This problem was underrated even not so long ago and now we pay dearly for it because the capacity of our engineering industry is limited. We are exploring the possibilities

of increased production of electrostatic precipitators at Milevsko and we got at least that far that every new investment project, every new production must have the precipitators in perfect condition.

[Question] Flying ash and toxic substances are not our problem only. The energy situation resulting from the scarcity of crude oil forces all states to gradually switch to solid fuels.

[Answer] Yes. Virtually in all Europe the interest in those problems has mounted and resulted in convening an international conference in Geneva between 13 and 16 November this year. There are two items on the program: the adoption of a convention on the protection of air polluted by the transmissions over long distances (by that is meant the transmission of fumes and harmful substances from one state into another--after all, the atmosphere does not recognize any state boundaries). The second item on the program is the question how to speed up the introduction of new technologies with minimum or no waste in individual production processes. At this conference, we shall present our experiences in glass and paper industry.

[Question] Could we thus say that the pressure for economic efficiency is the guarantee of improved environmental protection at the same time?

[Answer] Naturally. I would like to emphasize in this context that the environmental protection is thus becoming one of the important criteria which not only affect, but also govern and promote economic progress.

[Question] Can you be more specific in this respect?

[Answer] Naturally. Czechoslovakia does not abound in water resources and we must therefore use them economically. This must be realized by every citizen in his everyday water consumption. The production sphere begins to install closed water recycling circuits which represents a higher principle of water purification. In this purification process we can obtain from waste a secondary raw material and thus we not only purify water, but also enlarge our raw materials basis. As a result, we shall not extract this raw material from nature and thus deviate the living environment. It is like a vicious circle since we talk about one and the same thing all the time: about the pressure for efficiency as the guarantee of the living environment! When we use energy economically, less of it will have to be produced and the stacks will smoke less...

The view that our living environment is the reason for a headache is neither correct nor justified. We are not threatened by any ecological crisis nor by stress situation from the migration of the population. We have realized the situation in our water resources early and do not expect a disastrous deterioration of atmosphere in the future. Naturally, there are and will be problems in some areas. We owe very much to Northern Bohemia, where and also elsewhere we pay dearly for the previous period of certain laxness

and for the inadequate political attention to the large complex of problems of living environment. The socialist society must demonstrate its advantages precisely in successfully coping with the ecological problems facing the mankind. Freeing the mankind of fear of thirst can be achieved only on the basis of a well-thought-out conception of development of the national economy. It is therefore imperative that we approach the protection of the living environment with the idea that no measure designed to achieve this purpose complicates the fulfillment of economic tasks, but on the contrary promotes higher efficiency of the entire national economy.

[Question] How can we ordinary citizens contribute to a better living environment?

[Answer] I would like to say: by a greater respect to nature, by not littering our forests, by not vandalizing our parks, by not washing cars in the rivers and so on. But most of our citizens already know that and behave accordingly. There is one large area, however, in which the broad public can help. The workers must judge their plants also from the standpoint of environmental protection. In other words, they must apply pressure for efficiency, for the observance of regulations on the environmental protection. They must not be indifferent to whether or not the filters work properly. They must not be indifferent to the environment in which they live after work and in which their children grow up.

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**SPREAD OF CONTAMINATION FORCES CHEMICAL PLANT SHUTDOWN**

Buenos Aires LA NACION in Spanish 20 Oct 79 p 12

[Article: "Contamination: 'The Damage Is Serious and Irreversible'"]

[Text]. La Plata—The La Plata Medical Controller's Office has furnished with specialized information several doctors who had to treat workers at the insecticide factory at Florencio Varela, where a serious case of contamination occurred concerning which we have received information.

At a press conference, the head of the above-mentioned medical institution, Dr Alberto L. Poli, showed reporters extensive documentation — over 50 books and various envelopes and folders containing pamphlets, publications and photocopies — which covers different aspects of industrial safety, prevention, pathologies, etc. in dealing with chlorine and its derivatives.

"The problem," Dr Poli said, "concerns not only the dermatological aspects of the matter, which are important, but the fact that processes of asphyxiation also intervene. I cannot say whether there have been such processes or not, but I can assure you that inhalation of and direct contact with chlorates, without taking the prescribed precautions, can produce these consequences and also acute pulmonary edema."

"I do not agree," he said, "with statements to the effect that the problem is not a high priority matter. People have been injured and children too, and the damage is serious, with irreversible consequences."

He said that in referring to the matter he preferred to do so in general terms, without limiting himself to the episode that gave rise to newspaper comments. He added that in initiating discussion on this topic it was necessary to regard human beings as central and not as serving an economic concept. Given this order of affairs, he wondered whether it was necessary to manufacture this kind of product in this country and under these conditions, whether the factories took the necessary precautions, whether it was impossible to handle these chemicals in any other way than through direct contact and whether the capital involved was domestic.

He agreed that this is not the same kind of case that occurred in Seveso, inasmuch as an accident, an explosion that produced a cloud of dioxane which contaminated a huge area, occurred in that Italian town.

However, he wondered whether we ought to wait for an accident of that kind to occur in this country or whether we ought to take all possible steps to prevent it. He stressed the fact that, while this case was not the same as the one in Seveso, the skin damage attested to up to now, suffered not by one or two persons but by some 20, is real, although the effects of this contamination will not be exhausted in this damage alone. And finally, he warned of the danger that the handling of chlorates at high temperatures may represent.

He insisted on the fact that he wanted to imbue his words with generality and observed that the objective circumstances that have occurred were not meant to pass judgment in any way on the planned industrial relocation of Greater Buenos Aires.

#### Shutdown

As we reported on the first page of this issue, the provincial Ministry of Health yesterday shut down the SAIC [expansion unknown] chemical synthesis plant for "reasons of preventative safety."

This measure was made public late in the evening and did not fail to give rise to some surprise in the news media since prior official reports had discounted the importance of this instance of contamination and we had also been assured that the "critical sector" of the plant had been deactivated.

At the same time, reports were circulating which indicated that a Health Department official associated with the industrial controller had resigned. No other details were issued, nor did any kind of information on the report that was circulating at practically the same time the official communique reporting the shutdown appeared, reach the official news media.

People in circles close to the governor's residence were also saying that Governor Saint Jean was personally interested in the matter and had asked the Ministry of Health for all available information as of then on the file in question.

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ARGENTINA

BRIEFS

SKIN DISEASE DETECTED--The Health Ministry has ordered the halting of work at the Sintesis Quimica Saic enterprise. This order was issued as a preventive measure due to the skin disease detected among the workers of this insecticide producing factory and, in some cases, on members of their families. It was also reported that the toxic acne which appeared on workers who had actually been in contact with products based on chlorine and phosphorus can be cured with treatment and that it represents no danger for the neighboring population. [Buenos Aires LA RAZON in Spanish 20 Oct 79 p 7 PY]

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## BRIEFS

**CONSERVATIONIST MEETINGS**--The Provincial Committee of the Scientific and Technical Council for flora and fauna conservation was established on Sunday in Santiago de Cuba at a meeting presided over by Commander of the Revolution Guillermo Garcia, member of the Politburo and vice president of the Council of State. The meeting reported on the forest and fauna resources of the province with special emphasis on the Sierra Maestra and the areas proposed by the Academy of Sciences as areas to be protected for their natural characteristics. In a special address Commander of the Revolution Guillermo Garcia recalled the extraordinary natural wealth of the eastern mountainous zone which has been so valuable as a haven and stronghold for the rebel army combatants during the revolutionary struggle. And he called for work to recover this patrimony. He stressed the importance of teaching and dissemination by the committee and called on its members not to become bureaucratized and to work speedily and dynamically in conjunction with the experiences of the masses. [Text] [FL191143 Havana Domestic Service in Spanish 1100 GMT 19 Nov 79 FL] Commander of the Revolution Guillermo Garcia Friaa, member of the PCC Politburo and vice president of the Councils of State and Ministers, made the closing remarks at the meeting establishing the Gramma Province Flora and Fauna Conservation Committee. The Gramma working team is headed by Pedro Garcia Lupianez, president of the Gramma Provincial People's Government Assembly, and includes representatives from organizations dealing with environmental protection. Angel Matias Gonzalez an engineer and member of the National Institute of Forestry Development and Exploitation [INDAF] in the province in that eastern territory of the country read a report on the natural characteristics of Gramma and the proposal for its protection. In his closing remarks Garcia Friaa stated that man, sometimes because of the need for development and other times unintentionally, breaks the balance of nature. He then has to reestablish the ecological balance through conscientious and sustained work. Other presiding at the meeting were Emilio Loo Hernandez, member of the Central Committee and first secretary of the party in Gramma Province, and Abelardo Moreno, president of the Scientific Council for the Conservation of Flora and Fauna. [Text] [FL201427 Havana Domestic Service in Spanish 1200 GMT 20 Nov 79 FL]

VENEZUELA

BRIEFS

MERCURY CONTAMINATES FISH--Maracaibo, 14 Oct--A high concentration of mercury which is detrimental to human consumption is to be found in almost all the fish in Lake Maracaibo, a phenomenon caused by the installation of a sodium chloride [clorosoda] plant at the El Tablazo petrochemical complex in the Miranda district. Prof Jesus Ortega, of the Faculty of Engineering, University of Zulia, gave a full explanation of the threat of mercury contamination of the lake during a conference on the environmental problems of Zulia held at this university under the auspices of the Student Social Protection Office. Ortega said that, based on studies conducted in the chemical analysis laboratory of the Faculty of Engineering, it was determined that this kind of mercurial contamination is irreversible. The investigations conducted reveal that some species of fish in the lake have mercury concentrations of over 0.3 milligram, which the World Health Organization specifies as the maximum tolerable level that food fit for human consumption can contain. It takes approximately 70 days before mercury is eliminated from the human body; however, if during this period there is additional consumption of contaminated fish, the concentration becomes harmful to health. Therefore, it was recommended that the consumption of lake fish be avoided as much as possible because of the danger of contamination which they present. [Text] [Caracas EL NACIONAL in Spanish 15 Oct 79 p C-15] 8143

CSO: 5000

## ACUTE WATER SHORTAGE AT LERALA VILLAGE REPORTED

Gaborone DAILY NEWS in English 18 Oct 79 p 1

[Article by Lentlhabile Maano]

[Text]

Lerala village in the Tswaing North area is experiencing acute water shortage which at times leaves the local clinic staff exchanging diesel for water at Sherwood.

Development projects are also at a standstill unless a miracle happens. Headman Mr Shew Moreka fears that residents might soon have nothing to eat.

According to the enrolled nurse in the clinic, Miss Bathobonitsi Kgosilentswe, the water shortage is so serious that they are sometimes forced to exchange a gallon of diesel for some drums of water at Sherwood.

She stated that they normally reserve water in two medium size tanks, but this water does not last long.

When the Daily News visited the clinic on Monday, one of the tanks was empty while the other was half full, and there was no water coming from the borehole. Miss Kgosilentswe said that the water shortage might become catastrophic unless it is remedied soon.

She explained that there are medicines and pills which have to be taken with water and wondered what will happen to patients needing these medicines if the remaining water gets finished.

Added to this water problem is communication difficulty. The enrolled nurse pointed out that sometimes the telephone does not work. And on October 18 they were only receiving incoming calls.

The village headman, Mr Moreka was at pains trying to find words to explain the water problem. "We do not drink, wash and at times do not cook," he said. He explained that although the borehole might not be having enough water, the two reservoirs are too small for the whole village.

The water crisis seems to be made worse by the fact that the pipes taking water from the borehole, three to four miles away, leak, the explanations given by the people who helped the headman during the interview showed that the pipes need to be replaced.

One speaker stated that sometimes the leakage becomes so serious that many gallons of water flow into the bush.

Mr Moreka stated that development projects like the new school, clinics and local police houses and the renovation of the teacher's quarters are at a standstill. He said that the people's efforts to develop their village through self-help are frustrated by this water shortage.

He also expressed fears that the residents of the already semi-arid area, who already come late for Igoda meetings, might have no alternative but to stay away in search of water. Mr Moreka added that he would not be surprised if starvation starts claiming lives because people are using their few coins to buy water instead of food.

The Headman stated that the residents buy water from individuals who have wells some miles from the village. He added that these individuals have to water their livestock first so these lucky menage to get remaining drops. He expressed the hope that the Government would find some ways of alleviating the water crisis before people start deserting the village.

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BRIEFS

**WATER SHORTAGE HITS KWENENG**--The survival of man, livestock and vegetation in the Kweneng District poses a problem to the authorities there, because of the critical water shortage which has hit some villages in the district. Many boreholes are reported to have broken down three months ago while others produce inadequate water with the likelihood of going dry being imminent. As a result residents and livestock travel long distances in search for water. The situation has also forced development projects in the area to be at a standstill. While the Kweneng District Council supplies teachers with water in the most hard hit villages of Kgope, Medie, Mnopane, Tsotseng, Moshaweng and Takatokwene, residents become victims of over-charging by the transport operators in the area. They are compelled to pay between P2 and P3 per container. The Kweneng District Council has drawn a programme to drill boreholes in the district as an attempt to 'arrest' the situation. The Council has however, not indicated when the actual work is to be started and how many boreholes will be sunk. [Text] [Gaborone DAILY NEWS in English 15 Oct 79 p 2].

**Tswapong GETS SHOWERS**--Several places which have been hit by acute shortage of water in and around both Tswapong South and North were last week blessed with a few showers of rain after a long spell. All of a sudden, villagers began to experience the cheers of swimming children, the croaking of frogs and the mooing of cattle. The valley running through the Nwaps village was overflowing. The local dam was also overflowing. One voice from an elderly woman was heard saying "God has at last remembered his creatures on mother earth." The Tswapong area was one of the most threatened by drought in the country. Before these rains the whole area had turned brown on the surface. The condition on livestock was also very unpleasant. [Text] [Gaborone DAILY NEWS in English 30 Oct 79 p 2]

CSO: 5000

SOURCE OF ARSENIC IN KLEIN WINDHOEK RIVER UNKNOWN

Windhoek THE WINDHOEK ADVERTISER in English 20 Nov 79 p 1

[Text]

PARENTS have been warned to keep their children and pets away from the Klein Windhoek River because of the danger of arsenic poisoning.

This warning was issued by a spokesman for the municipality's Health Department this morning. It was impossible to take further steps, he said, until the source of the poison had been found.

Inspectors from the department had been investigating all the industries discharging the river in the northern industrial area, but so far nothing had come to light.

"However, it must be kept in mind that there are a large number of stormwater drains which empty into the river - from Kaiser Street, Tel Street, the Scholte road and others", he said.

He added that the arsenic could have been thrown into the river for many, not necessarily along its banks in the northern industrial area.

He said that various laboratory tests were being done, but it had not been established as yet what percentage of poison was in the water. This would establish exactly how serious the matter was.

On a question, he answered that the municipality was not empowered to exact any penalty from an industry or business that had been the cause of the offence.

"The municipality can only sue the guilty party to court and the court will determine what the penalty would be".

A total of seven horses - from the riding club in the near vicinity of the river in this area - have died as a result of arsenic poisoning.

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## CAUSE OF KLEIN WINDHOEK RIVER POLLUTION UNDER STUDY

Windhoek THE WINDHOEK ADVERTISER in English 21 Nov 79 p 3

[Text]

CONFUSING and confusing facts have come to light about the serious contamination of the Klein Windhoek River.

According to the South African Bureau of Standards laboratory in Pretoria, all the samples sent to them for analysis have proved to be negative, whereas tests done by the Windhoek Municipality's laboratory and the Department of Water Affairs laboratory have proved to be positive. However, it has not been established as yet in what quantity.

This morning Mr Post Board of the municipality's Department of Health confirmed that the situation was still static and that it had not been determined as yet where the contamination had come from.

"The SABS has said that their tests are negative and are now doing various other tests to find out what could have caused the contamination." It could also have come from some sort of insecticide, he added.

In any case, the public has been warned to keep children

and pets way from the river. To date a number of boats have slid out from under the bridge to "uncontaminated water" to the river.

Yesterday Groot officials searched the Klein Windhoek River for possible sources after taking samples from the river opposite business premises along the banks.

People in the know have ruled out the possibility of sabotage, and according to one spokesman "We are investigating a large variety of possibilities, but the poison (whatever it is) probably landed up in the river in quite an innocent way."

One possibility raised was that someone could have buried a container of insecticide in the river bed during a drought some years ago to combat a locust plague. By then the container might have become eroded and released contents into the water after the recent rains.

Another possibility was that effluent could have run off from industries along the banks, or even from the open mining in the vicinity of Windhoek.

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## 'BIOSFERA' RESEARCH VESSEL

Moscow NEDELYA in Russian No 39, 1979 p 4

(Article by Z. Aleksandrova (Barnaul): "Up the Biya River")

(Text) The 70-km voyage of the new motor ship, the "Biosfera," up the Biya from Turochak to Teletskoye Lake became a kind of sensation locally: this stretch of the river is considered completely insurmountable for any ships whatsoever. The staff members of the Teletskoye Lake Station of the Western Siberian Administration of Hydrometeorological Services brought their ship over it to its destination.

It is not easy to travel on a mountain river full of rapids, having a draft of more than 1 m. The "Biosfera" overcame some shoals 600-900 m in length in 1.5-2 hours, and only once during the entire voyage did the propeller brush slightly against the rocks, and this was due to the condensation fog, as specialists call it, which covered the surface of the water with a half-meter shroud. In one place it was necessary to dismantle a bridge to let the ship through. Another few kilometers over the lake and the "Biosfera" was at home, in the settlement of Yaylyu. Experienced Engineer-Capitan A. Poshchelenko supervised the entire voyage, pilot G. Kudryavtsev, a former local raftsman and fisherman, helped him in the especially difficult places.

Not by chance did the staff members of the station name the new research vessel the "Biosfera." The organization and making of background observations for the evaluation of the influence of the economic activity of people on the biosphere and on the environment are included in the task of the station.

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## AMUR RIVER CONSERVATION MEASURES STRESSED

Moscow TRUD in Russian 11 Oct 79 p 3

[Article by A. Akulinchev, First Deputy Public Prosecutor of Khabarovskiy Kray: "The Key to the Gifts of the Amur"]

[Text] "I have been living in Khabarovsk for a long time," writes war and labor veteran Yevgeniy Vasil'yevich Doronin, "but I do not recall any time when the Amur became so shallow that the fish reserves were impoverished. Is this not a result of the construction of the Zeyskiy GES?"

Ye. Doronin, Yu. Berezin, A. Melant'yev, P. Voronin and other TRUD readers have asked that the attention of the planning organs, ministries and departments be drawn to the problems of the shallowing of the Amur and the task of restoring the large fishing industry on the river.

It is these letters which provide the theme of this article.

For thousands of years the Amur has favored its people with seemingly inexhaustible riches. Indeed, even now no river in the country can rival the Amur for diversity of fish. More than a hundred types of fish are found there--Siberian and humpback salmon, sturgeon, carp, amur, salmo thymallus and kaluga; some of these breeds attain a weight of 500-800 kilograms.

It should be said that as a result of the measures taken, in recent years there has been a considerable replenishment of the school of carp. Under the influence of the fish conservation scientists and agencies the fishermen are now catching up to 40 tons of kaluga a year. This is not so many. But the encouraging fact is that this species has survived and increased in size to the point where it is a dependable industry.

Nevertheless, the problem of conserving the unique Amur ichthofauna is one of the most acute, as is the worry that the shallow water will deplete them. And other interrelated factors are involved. For example, in the summary months of this year the water level in Khabarovsk did not go over the zero mark. In early August the water measuring services registered minus

120-130 centimeters. In all the years of observations there has been no record of a level like this.

The dry summer in the Amur and Transbaykal regions, which are the sources of the river, has dehydrated it. This has affected the fish reserves. By the beginning of the 1970's the number of part-time fishermen fell to an unprecedentedly low level. The industry's center of gravity shifted to the less valuable species: podust, hippocampus and groundling. The white and black amur, bream and yellow perch have become sparse. The shoaling has resulted in some sectors of the river becoming unnavigable.

In view of the shoaling of the Amur, are the complaints directed against the Zeyskiy GES and the Bureyskiy GES, which is under construction, well-founded? No. The natural regulator of the river level has always been the floods caused by the summer monsoons. In fact this also accounts for the unique formations in the Amur basin. In the years of the heaviest summer rains the average and lower course of the river's overflow has attained a level of 10-12 cubic kilometers and the number of floods has reached four-six. But, as I have already said, recent years have seen a considerable diminution in the intensity of the summer monsoons. The Amur, which is not fed by any other sources, has begun to shoal to a catastrophic degree. Under these circumstances the water level would be maintained by the Zeyskiy reservoir, which has been regarded as not only the energy heart of the Amur region but also the regulator of the level of the river.

This summer the Zeyskiy GES supplied 600 cubic meters a second to the Amur and actively supported the river at a very difficult time. In its full planned capacity the steady discharge from the water reservoir reaches 1200 cubic meters a second. The specialists believe that this has a favorable effect on regulation of the oxygen system necessary for the Amur fish, particularly in the summer months.

The healthfulness of the Amur is undoubtedly also affected by the activity of the enterprises located in its basin. There are more than 300 of them in Khabarovskiy Kray alone. And every one of them, to a greater or lesser degree, uses the Amur water. It should be noted that intensive construction of water conservation installations is in progress there. Whereas in the Ninth Five-Year Plan 38,723 rubles were expended for these purposes, in just three years of the current five-year plan the amount is already 44,965 rubles. As a result, the volume of wastes discharged into the water reservoirs of the kray has been cut in half.

But, despite the scope of this work, the measures taken are inadequate. Of the cleaning systems in the kray 35 percent operate ineffectively. In the three years of the construction of these in Khabarovsk the Ministry of Housing and Municipal Services RSFSR has used only a small proportion of the funds stipulated by the estimate. Still incomplete is the construction of the complex of biological cleaning units in Komsomol'sk-on-Amur. And badly needed installations in Vyazemskiy have not been put into operation.

Serious violations of the environmental protection laws are being committed by enterprises of the Ministry of Timber and Woodworking Industry USSR. Year after year the All-Union Far East Lumber Industry Association Dal'lesprom has been disrupting the task of putting the cleaning systems into operation in the lumber camps. In addition, breakwater floating of timber is inflicting damage on the river.

The Ministry of the River Fleet RSFSR is not fulfilling the plan for equipping ships with the means to prevent pollution. The construction of special sanitation vessels is proceeding at a slow pace. Also "helping" to pollute the Amur are the enterprises of the Primorskiy Kray Gold Mining Association Primorzoloto and the enterprises of the USSR Ministries of Non-ferrous Metallurgy, of Petroleum Extraction Industry, and of the Cellulose and Paper Industry.

In the past six months the public prosecutor organs have conducted 110 checks of adherence to the environmental protection laws. Persistent violators have been charged with criminal, disciplinary and financial responsibility. In exceptional cases the Far East basin administration for the regulation and utilization of water has suspended the operation of some sectors and shops.

The status of the fish reserves in the Amur makes it imperative to regulate amateur fishing. A great deal has been done in this regard. And yet there are still too many violations of the fishing regulations. In the last six months alone more than 3,000 cases of poaching were turned up. Fines totalling 52,410 rubles were levied.

There are now more than 35,000 private motor boats and launches operating in the lower reaches of the Amur. Every year hundreds of units are added to this amateur fleet. It is essential to regulate its operations and limit its capacity.

It is apparent from what we have said how many troubles plague the Amur. In recent years the local organs have attempted to draw the attention of the economic organizations to the need to improve the health status of the river. On such lakes and water reservoirs as the Sinda, Biksur, Gassi and a number of others hydrotechnical and land improvement work has been planned, with financing to be provided by the appropriate departments. The time limit has been set for two years. Five commercial fishing establishments slated for construction are supposed to get an initial allocation of 13,000 fish and later one of 25,000. According to the estimates of the scientists, this would guarantee escalation of the fish catch to 30-35,000 tons a year.

Unfortunately, this initiative has not been supported in the ministries. The association Primorzoloto, for example, which was supposed to complete hydrotechnical work on Lake Gassi last year, has not even started it. The executives give as the reason for their position the fact that the

damage which their industry inflicts on the river is not a valid economic basis for this work. But the fact is the enterprises of the association operate on such large Amur tributaries as the Amgun' and the Tumanin. One of the artels was fined 360,000 rubles for polluting the water reservoir.

The logging organizations have not been behaving any better. The Far East lumber industry association Dal'lesprom has not begun to do anything on the Sinda reservoir. If you listen to the executives of the association, you tend to get the impression that they are unaware of Article 18 of the USSR Constitution, which obliges all of us to conserve the natural wealth. The result of the lack of attention to this requirement is that some enterprises do not consider it mandatory to monitor the consumption of water and they are exceeding the scientifically determined norms for water expenditure per unit of output.

The time has come to shift from talk to action. Two paths are open to us in this matter. First: to order the ministries whose enterprises are located in the Amur basin to carry out hydrotechnical and land improvement work through contract organizations. The plans and volumes of this work should become state assignments.

The other approach is to concentrate the facilities, equipment and materials earmarked for improvement of the healthfulness of the river in the hands of a high-powered specialized association which works in close cooperation with the organizations of the Amur fishing association Amurrybvod and the scientists of the Amur branch of Tinro [Pacific Ocean Scientific Research Institute of Fisheries and Oceanography]. In this case and in others there is need for in-depth comprehensive ecological studies of the river and widespread popularization of them among the population. Other realistic variants are apparently also possible.

Only one thing is inadmissible--an indifferent, purely departmental approach. The Amur is urgently asking for help. The current neglect is aggravating an already difficult situation, will create serious and ever-increasing difficulties for the Amur national economy, and will ultimately considerably increase the cost of remodelling the most important water main and fish repository of the Far East--one of the most beautiful rivers in Russia.

7962  
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## THE PROBLEM OF INDUSTRIAL POLLUTION IN ARMENIA EXAMINED

Yerevan KOMMUNIST in Russian 10 Oct 79 p 2

[Article by L. Alaverdyan, First Secretary of the Tumanyanskiy Raykom of the CP of Armenia: "The Alaverdi Potential"]

[Text] The Alaverdi Potential and the Everyday Concerns--the KFD [Efficiency Factor] and Fumes of the PZhV [Process of Smelting in a Liquid Vat]--the Future of the Combine--Not Withdrawal but Reorientation--An Active or Passive Balance?--The Debed Flows to the Gardens.

In Alaverdi there is today probably not one person whose heart would not evoke a warm response to L. I. Brezhnev's words [on environmental protection].

When the important state interests are at stake, all the decisions made are for the greatest benefit of the people. The party and government always incorporate this wise precept in every one of their decisions. And today when the entire world is echoing a note of discord between man and nature, our country is taking effective measures to curb this evil.

There is an example of this in Armenia--the virtually heroic epic of the salvaging of the Sevan lake and the construction of the vast Arpa-Sevan tunnel under incredibly difficult conditions. Another example of this concern and of objective solutions is the reorganization of the Razdanskiy Mining and Metallurgical Combine for the purpose of preserving the health zone of children's camps and boarding schools in Tsakhkadzor and Ankavan. A priority concern today is Alaverdi, the city and its outlying areas with their vast economic potential, areas which are today feeling the effects of many years of noxious waste gases from the Alaverdi Mining and Metallurgical Combine.

The weight of the Alverdians' contribution to the treasury of the republic and country is measured in scores of millions of rubles. And the largest share of the labor can be credited to the collective of Alaverdian metallurgical workers. Throughout 10 labor five-year plans the name of Alaverdi has

been pronounced with pride. But time has elapsed and these buoyant notes have more and more frequently come to be interspersed with notes of uneasiness and anxiety.

The enterprise's last large remodeling project to double its capacities and to trap the noxious production waste emissions was begun in 1958. They were able to accomplish the first part of the task in rapid fashion. The second part has still not been fully resolved.

In 1973 the sum of 25 million rubles was allocated for measures designed to improve the healthfulness of the environment. The implementation of utilization of the waste gases provided an industrially beneficial solution for the problem: all the gases of weak and strong concentration emitted in the basic production are channeled into a sulfur combustion unit, mixed, subjected to a moist purification process, and transmitted to the sulfuric acid shop. The expectation was that at one stroke they would be rid of the sulfur dioxide discharges and at the same time obtain an additional quantity of the sulfuric acid which is needed by the enterprises of the republics of the Caucasus and the North Caucasus.

However, this would have been an ideal solution. In practice there is the paradoxical situation wherein the KPD--the efficiency factor--of the enterprise is proportionately determined by the percentage of emission of noxious gases. The higher the KPD, the greater the discharges.

One can frequently hear expressed the narrow-minded judgment that they are polluting and poisoning the atmosphere and no one gives it any thought. We disagree: they do think about it every day and every year they are taking vigorous measures to trap the gases and liquid discharges. But by today's standards this is, of course, only a drop in the bucket.

Last year we completed the corrections on all the previous plans and technical solutions for the combine, including the technical plan for improving the healthfulness of the region's air basin. The work was done by the Arnniprotsvetmet [Armenian Institute for the Planning of Nonferrous Metallurgy Enterprises], the Moscow Giprotsvetmet [State Institute for the Planning of Nonferrous Metallurgy Enterprises] and a number of other institutes and institutions. Dozens of authorized commissions visited Alaverdi. Their mission was to review this corrected plan and prepare a new assignment: to determine the advisability of eliminating from the technological scheme the process of production of copper concentrates and reorienting the combine's production for expanded capacities for electrolysis of copper and blue vitriol. At the same time, attention is being given to the problem of organizing production of powdered copper, rolled stock and, perhaps in the future, copper foil. This whole complex of problems is in the stage of operational solution.

Thanks to scientific progress and the development of our prosperity, we today possess the maneuverability capabilities and the potentialities for a

for a regime in which we can modify conditions in a fundamental way. In collaboration with the scientists of the Ukraine and Armenia the combine conducted semi-industrial testing of the method of pulverizing smelted metal with water under high pressure and pulverized copper is being obtained as a result. In the two years of this project the collective of the combine has been actively assisted by the workers of the NII [Scientific Research Institute] for Problems of the Processing of Materials in the system of the Academy of Sciences of Ukrainian SSR and the Armmiprotsvetmet. The powder now obtained in the combine is sent to industry to undergo technical tests. It was no coincidence that last year Yerevan was the site of a conference of scientists who addressed the task of developing methods of obtaining the metallurgical powders and instruments needed for this purpose.

The question of organizing atomized powder shops and sectors at the ferrous and nonferrous metallurgy enterprises is currently being studied as one of the long-range problems on a Union scale. Technical and economic justifications for the planning and construction of such a shop are also being prepared by us in Alaverdi. The conversion to the PZhV--the process of smelting in a liquid vat--will provide a new dimension to the combine's activity.

Hardly anyone seriously believes that giving up such a major production project as the preparation of sulfuric acid and blister copper at the combine is an easy process, one which requires merely a paper solution. There is in economics the concept of an active balance (when we export more output than we import) and a passive balance. Disruption of this established balance in the economics of the enterprise is undesirable from many standpoints: there is a corresponding disruption of our party relations and planning estimates and our personnel problems are affected. And to insure that the reorganization process will proceed smoothly, it is essential to do a great deal of thinking and to make advance preparations. This too we are doing. Removal of sulfuric acid production from the Alaverdi combine would necessitate transferring it to some other enterprise in order not to upset the overall economic balance of the industry. And this is indicative of the great attention and solicitude for the population of our geographic region with its complex topography. In return for this we cannot help but experience feelings of intense gratitude.

Together with the scientists, the economists and the industrial executives, we have analyzed and compiled careful estimates of the potential for following up the elimination of metallurgical and sulfuric acid production with the manufacture of commodity output, expansion and remodelling of the blue vitriol shop, and starting of production of copper powder. Three variants have been prepared with respect to the production and distribution of output, the cost of producing it, and the number of workers. All the variants eliminate production of copper and sulfuric acid but in the productivity of the enterprise this has the favorable effect of doubling the capacities for the other types of output. The state and the enterprise both gain in this. The city of Alaverdi and the surrounding areas benefit because it puts a stop to the pollution of their natural environment.

The combine is holding on to its nucleus of highly skilled personnel but the surplus of working hands is today needed to staff the canning plant, the sewing factory and a number of other enterprises. There seem to be realistic and desirable potentialities for the production of fine copper wire and foil at the combine. We are organizing production of polymeric concrete there. Awaiting a decision is the question of manufacturing consumer goods from local stone, wood and galvanoplastics.

If we face up to the truth we realize that the conditions of the ravine where the city is located are such that no matter how much the scientists and specialists search for a way out and no matter how much effort the production people make, the noxious gases from the current production will pollute the atmosphere.

Anyone who has seen Alaverdi in gloomy weather has had no doubt about the density of the smog. The natural "exhaust pipe" formed by a drop in atmospheric pressure and favorable winds operates only on rare days. And what about the rest of the year when the atmosphere in the area of the combine is hourly assailed by as many as 135,000 so-called normal cubic meters of gases with their noxious impurities: 80,000 of these from the sulfuric acid shop, 40,000 from the electric furnaces and 15,000 from the converters? The density of the gases and dust frequently exceeds the permissible norms.

Special commissions have often determined that the low level of the agricultural yield on the adjacent kolkhozes and sovkhozes is due to the oxidation of the Debed waters which are used for irrigation. Even a partial malfunctioning in the meadows, gardens and timber tracts within a radius of 25-30 kilometers cannot fail to cause alarm. And the situation is particularly serious when it involves the waste waters which are discharged into the Debed.

Great damage is inflicted every year on the agriculture within range of the "respiration" of the combine. In the period of the blossoming of the gardens one hour of intensive gas diffusion is enough to bring about a loss of the future yield. Thus, on the Shnokhskiy sovkhoz a considerable number of hectares of fruit trees were made unproductive. Many farm organizations in the region sustain great losses because of this. Hundreds of hectares of timber are drying up and apiculture is suffering damage. But is it always right to translate living nature into monetary terms? If we get at the root of it, it is not only a matter of thousands of rubles! In our technical age the losses in apiculture now constitute a morale factor. It is easier to build a house, our national experience indicates, than to grow a tree. And however much we respect the arduous labor of the metallurgical worker, we cannot escape the comparison: it takes hours to smelt a ton of metal and months to raise a swarm of bees or a flock of sheep.

The specialists believe that the existing conditions in Tumanyanskiy Rayon are retarding the development of annual and perennial grasses. A number of examinations of deceased young animals--lambs and hogs--showed that they were poisonously affected by the copper anhydrides which penetrated their

systems through the fodder. The executives of the party and soviet organs see no way to brush aside the facts and figures and this is forcing us to ask the higher directive organs of the republic and the Union ministry to resolve this problem as rapidly as possible and to appeal to the scientists for effective assistance.

The CPSU Central Committee and USSR Council of Ministers decree promulgated this year on "Additional Measures to Strengthen the Protection of Nature and Improve the Utilization of the Natural Resources" as well as a whole series of party and government decisions for further development, maintenance and intelligent utilization of the republic's natural resources enable us to hope that in the very near future we will do an efficient job of exploiting the potential of the Alaverdi Mining and Metallurgical Combine. Also that the surrounding environment and the animal and plant world will attain a condition of natural and wholesome balance.

7962  
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**TEXT OF RSFSR DECREE ON ENVIRONMENTAL PROTECTION MEASURES**

Moscow SOBRANIYE POSTANOVLENIY PRAVITEL'STVA ROSSISKOY SOVETSKOY FEDERATIVNOY SOTSIALISTICHESKOY RESPUBLIKI in Russian No 10, 1979 pp 182-191

[RSFSR Council of Ministers decree signed by Council Chairman M. Solomentsev and Business Manager I. Smirnov]

[Text] Additional Measures to Intensify Environmental Protection and Improve the Utilization of the Natural Resources.

In fulfillment of Decree No 984 of the CPSU Central Committee and the Council of Ministers USSR dated 1 December 1978, the Council of Ministers RSFSR decrees the following:

1. The RSFSR ministries, state committees and departments, the Councils of Ministers of the autonomous republics, the krayispolkoms and oblispolkoms, the Moscow and Leningrad gorispolkoms, and the associations, enterprises, institutions and organizations are to bear full responsibility for protection of the natural environment, for rational utilization and reproduction of the natural resources, and for on-schedule implementation of the appropriate environmental protection measures.

The RSFSR ministries, state committees and departments, the Councils of Ministers of the autonomous republics, the krayispolkoms and oblispolkoms, and the Moscow and Leningrad gorispolkoms are to take additional measures to strengthen environmental protection and improve the utilization of the natural resources. They are to focus special attention on the development and introduction of systems which will engender a drastic reduction in the losses of minerals in the course of extraction and processing of them. They are to develop technological processes and equipment which will reduce production discharges and other harmful emissions into the environment. They are also to emphasize the need to supply cleaning equipment to all the sources of noxious discharges and to reduce to a minimum within the established limiting norms the discharges of pollutants into the atmosphere, the water media, and the soil.

The RSFSR ministries and departments tasked with the functions of checking the status and conservation of the natural resources, the Councils of Ministers of the autonomous republics, and the krayispolkoms, oblispolkoms and gorispolkoms are to intensify their control over the manner in which the state organs, enterprises, institutions and organizations comply with the USSR and RSFSR laws and the party and government decisions on environmental protection and rational utilization of the natural resources.

2. Gosplan RSFSR, the Ministry of Land Improvement and Water Resources RSFSR, the Ministry of Agriculture RSFSR, the Ministry of Timber Industry RSFSR, the Ministry of Health RSFSR, and the Main Administration for Hunting and Game Preserves under the RSFSR Council of Ministers are to be tasked with exercising control over fulfillment by the associations, enterprises, institutions and organizations of the appropriate environmental protection assignments established by the state plans for the economic and social development of RSFSR.

3. The RSFSR ministries, state committees and departments whose enterprises, institutions and organizations are the sources of environmental pollution are to organize in the central apparatus structural subdivisions responsible for protection of the natural environment and rational utilization of the natural resources within the limits of the established number and wage fund of the workers of the central apparatus of the pertinent RSFSR ministries, state committees and departments.

The Councils of Ministers of the autonomous republics, the krayispolkoms and oblispolkoms, and the Moscow and Leningrad gorispolkoms are to incorporate in the planning commissions (wherever this has not as yet been done) appropriate posts for environmental protection and rational utilization of the natural resources within the limits of the appropriations provided for the maintenance of state control organs in the respective autonomous republics, krays and oblasts and the cities of Moscow and Leningrad.

4. Simultaneously with the submittal to the RSFSR Gosplan and Council of Ministers of the long-range and yearly draft plans for environmental protection and rational utilization of the natural resources, the RSFSR ministries, state committees and departments, the Councils of Ministers of the autonomous republics, and the Moscow and Leningrad gorispolkoms are to forward to the Ministry of Land Improvement and Water Resources RSFSR, the Ministry of Agriculture RSFSR, the Ministry of Timber Industry RSFSR, and the Main Administration for Hunting and Game Preserves under Council of Ministers RSFSR the relevant sections of these draft plans for the enterprises, institutions and organizations under their jurisdiction (with an indication of the volumes of capital investments and the assignments for putting the environmental protection capacities and projects into operation).

On the basis of the draft plans for protection of the environment and rational utilization of the natural resources as drawn up by the RSFSR ministries, state committees and departments, the Councils of Ministers of

the autonomous republics, the krayispolkoms and oblispolkoms, and the Moscow and Leningrad gorispolkoms, these ministries and departments are to compile and submit to Gosplan RSFSR (within the prescribed time limits) the coordinated draft plans with the relevant sections for the RSFSR as a whole and with the distribution of assignments for the RSFSR ministries, state committees and departments, the autonomous republics, krays and oblasts, and the cities of Moscow and Leningrad.

Gosplan RSFSR is to submit the long-term and yearly draft plans for environmental protection and rational utilization of the natural resources to the RSFSR Council of Ministers for subsequent submittal to the USSR Council of Ministers and Gosplan. The appropriate sections of these draft plans (with an indication of the volumes of capital investments and assignments for putting the environmental protection capacities and projects into operation) are to be submitted to the USSR State Committee for Hydrometeorology and Environmental Control, the Ministry of Land Improvement and Water Resources USSR, the Ministry of Agriculture USSR, the USSR State Committee for the Timber Industry, and the Committee for Surveillance of Safety Precautions in Industry and for Mine Inspection under Council of Ministers USSR.

5. To define the comprehensive measures for environmental protection, for prevention of pollution and defiling of the natural environment, and for insuring the most effective utilization of the natural resources in the national economy, we have worked out territorial comprehensive conservation schemes.

The RSFSR ministries, state committees and departments, the Councils of Ministers of the autonomous republics, the krayispolkoms and oblispolkoms, and the Moscow and Leningrad gorispolkoms are to submit suggestions concerning the preparation of these schemes along with the yearly and long-term draft plans for economic and social development.

Gosplan RSFSR is to submit suggestions for the preparation of territorial comprehensive environmental protection schemes which will provide for the development of such schemes for the territory of RSFSR, the territories of the autonomous republics, the krays and oblasts, the various natural complexes, and the large cities and industrial centers whose environment is being polluted by the enterprises of various ministries and departments.

The capital investments for the construction (reconstruction) of installations as stipulated by the territorial comprehensive environmental protection schemes are specified in the yearly and long-term plans by separate lines which conform to the title lists.

Jointly with the RSFSR ministries, state committees and departments, Gosstroy RSFSR is to participate in the preparation by Gosstroy and Gosplan USSR and the USSR State Committee for Science and Technology of methodological directives for the compilation of territorial comprehensive environmental protection schemes.

6. The RSFSR ministries, state committees and departments, the Councils of Ministers of the autonomous republics, the rayispolkoms and oblispolkoms, and the Moscow and Leningrad gorispolkoms are to do the following:

In the 1979-1980 period compile in the enterprises, institutions and organizations under their jurisdiction an inventory of the sources of emissions of harmful substances and production wastes discharged into the environment, this inventory to be in accordance with the forms and in line with the instructions approved by the TsSU [Central Statistical Administration] and Gosnab USSR.

Within a month after obtaining these forms and instructions the TsSR RSFSR is to forward them to the RSFSR ministries, state committees and departments, the Councils of Ministers of the autonomous republics, the krayispolkoms and oblispolkoms, and the Moscow and Leningrad gorispolkoms. This inventory must be compiled by the associations, enterprises, institutions and organizations and the work of generalizing these materials and submitting them to Gosplan RSFSR by the appropriate RSFSR ministries, state committees and departments, the Councils of Ministers of the autonomous republics, the krayispolkoms and oblispolkoms, and the Moscow and Leningrad gorispolkoms.

Gosplan RSFSR submits the inventory materials to the Council of Ministers RSFSR for subsequent forwarding to the USSR State Committee for Hydrometeorology and Environmental Control (for the air basin), to the Ministry of Land Improvement and Water Resources USSR (for the water resources), and to Gosnab USSR (for the solid production wastes).

Jointly with the interested RSFSR ministries, state committees and departments, Gosplan RSFSR is to participate in the work of generalizing the inventory materials for the territories of RSFSR, the autonomous republics, krays and oblasts, and the national economy sectors (the water resources and the river basins) when this work is done in the first quarter of 1981 by the USSR State Committee for Hydrometeorology and Environmental Control.

The authorities are to make provision for coordination with the interested ministries and departments in the preparation of planned norms for maximum discharges of pollutants applicable to the enterprises, institutions and organizations under their jurisdiction, particularly the currently operating enterprises, institutions and organizations located in the zones of increased environmental pollution. These plans are to delineate a systematic program for putting these norms into effect with provision for adherence to the established norms for maximum permissible concentration of pollutants in the environment (the objective being to review these norms in the future for purposes of reducing the discharge of pollutants into the surrounding medium to the point of complete elimination). These plans are to be submitted to Gosplan RSFSR.

Jointly with the Ministry of Health RSFSR, the Ministry of Land Improvement and Water Resources RSFSR and the other interested ministries and departments, Gosplan RSFSR is to review these plans and submit them for approval to the USSR State Committee for Hydrometeorology and Environmental Control, the Ministry of Land Improvement and Water Resources USSR, the Ministry of Agriculture USSR and the Ministry of Health USSR.

Within time limits coordinated with the USSR State Committee for Science and Technology and Gosplan USSR and on the basis of the list established by the USSR State Committee for Hydrometeorology and Environmental Control, the Ministry of Land Improvement and Water Resources USSR and the Ministry of Health USSR, the authorities are to prepare and implement in the cities and industrial centers a complex of measures for the introduction in the enterprises, institutions and organizations under their jurisdiction of limited-waste technological processes and systems for neutralizing, recycling and cleaning gaseous, liquid and solid production and domestic wastes for the purpose of reducing the discharge of pollutants into the environment to the prescribed norms.

7. In coordination with the Ministry of Housing and Municipal Services RSFSR and the other interested RSFSR ministries, state committees and departments, Gosplan RSFSR is to submit to Gosnab and Gosplan USSR suggestions for the inclusion of sewage cleaning units (which are extremely important from the standpoint of environmental protection) in the list of installations which Gosnab USSR is to supply with equipment, instruments, cable articles and other materials beginning in 1980.

8. Because of the limited peat resources, the water-regulating role of peat moss, and the need to conserve the peat resources for agricultural needs, the Ministry of Agriculture RSFSR, the Ministry of Fuel Industry RSFSR, the Ministry of Land Improvement and Water Resources RSFSR, Goskomsel'khostekhnika [State Committee for Agricultural Equipment] RSFSR and Glavnachernozemvodstroy [Main Administration for the Nonchernozem Water System], with the participation of the Ministry of Agriculture USSR and the Ministry of Geology USSR, are to take measures for improvement of the utilization of the peat deposits.

In coordination with the appropriate RSFSR ministries and departments, Gosplan RSFSR is to submit to Gosplan USSR and the Ministry of Power and Electrification USSR proposed time limits for converting to other types of fuel the electric power stations which are located in the European part of USSR and now use peat as fuel.

To preclude any adverse effect which the geological prospecting and exploration work may have on the environment of the tundra zone and the BAM [Baykal-Amur Trunk Line] construction, the Councils of Ministers of the autonomous republics, the krayispolkomas and the oblispolkomas, with the participation of the Ministry of Agriculture RSFSR, the Ministry of Timber Industry RSFSR and

the other interested RSFSR ministries and departments, are to prepare and implement before 1981 a complex of measures for environmental protection in these zones. Particular attention is to be given to devising and implementing a system for the operation of mechanized transport in these zones, one which will eliminate the development of intensive erosion processes (in the thermal karst). They are also to provide for protection of the moss areas, the tundra peat bogs and the forests from fires, while seeing to it that this works, in compliance with the 1 December 1978 Decree No 984 of the CPSU Central Committee and the USSR Council of Ministers, is also carried out with the participation of the interested USSR ministries and departments.

10. With the participation of the interested USSR and RSFSR ministries and departments, the Councils of Ministers of the autonomous republics, the krayispolkoms and the oblispolkoms are to prepare in 1979 and implement a complex of measures to combat the processes of expansion of the desert areas in the arid zones, with particular emphasis on the work of reinforcing the drifting sands, establishing protective green plantations, and combatting soil salinity. They are also to establish a procedure and time schedules for pasturing of cattle, a schedule for the construction of oil and gas lines and other engineering installations, and a schedule for the operation of the mechanized transport and agricultural equipment in these zones.

11. The RSFSR ministries, state committees and departments, the Councils of Ministers of the autonomous republics, and the krayispolkoms and oblispolkoms are to submit to Gosplan RSFSR suggestions for including in the plans for contract work fulfilled by the USSR ministries and departments the appropriate volumes of work for recultivation of the lands with funds from the budget for operational expenses.

Gosplan RSFSR is to submit suggestions on these matters to Gosplan USSR.

12. Gosplan RSFSR, Gosstroy RSFSR, the RSFSR ministries, state committees and departments, the Councils of Ministers of the autonomous republics, the krayispolkoms and oblispolkoms, and the Moscow and Leningrad gorispolkoms are to do the following:

Intensify control over the planning of the construction of new enterprises and installations and remodeling of existing ones to enforce adherence to the regulations for protecting the environment from harmful pollutants.

Incorporate in the plans for construction and remodeling of enterprises and installations provisions for extensive use of limited-waste technology waterless technological processes, reversible water supply, nondrainage water supply and sewerage systems, and other progressive methods of protecting the environment from pollution.

The RSFSR ministries, state committees and departments, the Councils of Ministers of the autonomous republics, the krayispolkoms and oblispolkoms,

and the Moscow and Leningrad gorispolkoms are to regularly review the problems entailed in effective operation of the gas-purifying and dust-collecting units and water-purification installations used in the enterprises and organizations under their jurisdiction and they are to submit to Gosstroy RSFSR suggestions for further improvement of these units and installations in light of the achievements of science and technology, these suggestions to be subsequently forwarded to Gostroy USSR.

13. The Ministry of Agriculture RSFSR, Ministry of Timber Industry RSFSR, Ministry of Justice RSFSR, the Main Administration for Hunting and Game Preserves under Council of Ministers RSFSR, and the All-Russian Society for the Protection of Nature are to participate in the work of the Academy of Sciences USSR, jointly with the USSR Ministry of Agriculture, State Committee of Forestry and Ministry of Justice, for the preparation in 1979 of drafts of standard statutes concerning state game preserves, natural monuments, botanical gardens, zoological and dendrological parks, restricted areas, and natural (national) parks.

14. Beginning in 1979 the TsSU [Central Statistical Administration] is to arrange for the collection, processing and submittal by the appropriate state organs of collated statistical reports describing the fulfillment of the assignments for environmental protection and rational utilization of the natural resources, as stipulated in the state plan for economic and social development of RSFSR.

15. The RSFSR ministries, state committees, and departments, the Councils of Ministers of the autonomous republics, the rayispolkoms and oblispolkoms, and the Moscow and Leningrad gorispolkoms are to assist the respective organizations of the All-Russian Association for Environmental Protection in their exercise of public control over fulfillment of the conservation laws and dissemination of knowledge respecting environmental protection and rational utilization and reproduction of the natural resources, in developing and recording natural monuments, and in bolstering these organizations with skilled specialists and providing them with the requisite material and technical means.

Gosplan RSFSR and Glavsnabsbyt [Main Administration for Supply and Marketing] are to provide in their yearly plans for the allotment of the requisite material and technical resources to the All-Russian Society for Environmental Protection.

16. The RSFSR State Committee for Cinematography, State Committee for Publishing, Polygraphy and Book Trade, and Ministry of Culture, the RSFSR Znaniye Society, and the All-Russian Society for Environmental Protection are to provide for intensified work for indoctrinating the population with knowledge of conservation and rational utilization and replenishment of the natural resources. For this purpose they are to increase the output of informational and popular-scientific literature and motion pictures and they are to expand the organization of radio and television broadcasts as well as strengthen the lecture propaganda work on these subjects.

17. The public is to be made aware of these provisions of Decree No 984 of the CPSU Central Committee and Council of Ministers USSR dated 1 December 1978:

Responsibility for the organization and activity of the state system for surveillance and control of the condition of the environment.

Regulation of the utilization of the air basin of the cities and industrial centers and implementation of state control over the sources of air pollution and over compliance with the norms for maximum discharges of pollutants into the atmosphere.

Collaboration with the Ministry of Health USSR and the other interested ministries and departments in the preparation and approval of norms of maximum permissible discharges of pollutants into the atmosphere.

Review of the schemes submitted by the ministries and departments for coordination--the schemes for distribution of the installations for production and other purposes--and review of the plans for the construction and remodeling of these installations for purposes of enforcement of adherence to the requirements for the prevention of air pollution.

Compiling, jointly with the interested ministries and departments, a list of the instruments and apparatuses for controlling the environment and the sources of air pollution; also development of the technical requirements for these instruments and apparatuses.

Analytical preparation of statistical reports on protection of the atmosphere from pollution and compilation of regular and special information on the condition of the environment, the changes anticipated, and the reasons for these changes; these reports are to be submitted to the Council of Ministers USSR.

Establishment of a fund of information on the condition of the environment.

(b) The officials of the USSR State Committee for Hydrometeorology and Environmental Control and its local organs, which exercise state control over observance of the regulations and norms pertaining to environmental protection, are empowered to make visits in accordance with the established procedure to the enterprises, institutions, organizations, construction projects and other installations, regardless of their departmental subordination, to obtain the requisite materials and information, and to check on their competence. They are also empowered to make suggestions for forbidding or discontinuing the operation of existing production units of industry, transport and agriculture and municipal and other installations which are engaged in activities violating the established norms and regulations pertaining to safeguarding of the atmosphere; these steps are to be taken prior to implementation of the necessary measures.

The decisions for prohibition or discontinuance of operation of these installations are made by the executives of the USSR State Committee for Hydrometeorology and Environmental Control and its republic and territorial administrations and are reported to the directors of the appropriate ministries, departments, enterprises, organizations and institutions.

(c) It is stipulated that the title lists for newly begun construction of city purification installations which come under the "Municipal Services" sector are subject to approval in the manner prescribed by sections (a), (b) and (d) of Point 6 of the 10 July 1967 Decree No 643 of Council of Ministers USSR on "Procedure for planning of centralized capital investments and approval of construction title lists" (SP [Government Regulations and Decrees] USSR, 1967, No 17 p 119; 1970, No 19 p 150) for installations of the production category.

Beginning in 1979 the assignments for putting water and gas purification installations into operation must be set forth in the social and economic development plans of both the customer ministries and departments and the ministries and departments which are doing the construction and installation work. This is as stipulated in Point 1 of Decree No 389 of the CPSU Central Committee and Council of Ministers USSR, dated 28 May 1969 (SP USSR, 1969, No 15, p 82); this point pertains to the putting into operation of production capacities and installations.

(d) It has been made mandatory that the computation of the results of the socialist competition of the enterprises and organizations takes into account their fulfillment of the plans and measures for environmental protection and observance of the norms and regulations pertaining to the utilization of the natural resources and cleaning and recycling of the production wastes.

If the environmental protection plans and measures are not fulfilled, the directors (chiefs, managers), their deputies, the chief engineers of the enterprises and organizations, and the workers responsible for the nonfulfillment of these plans and measures lose all or part of the bonuses based on the fundamental results of the economic activity.

On the basis of reports from the organs which monitor observance of the norms and regulations governing the use of the natural resources, the managers and other workers of enterprises and organizations guilty of nonobservance of these norms and regulations lose all or part of the bonuses based on the fundamental results of the economic activity.

7962  
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## MEASURES UNDERTAKEN FOR PREVENTION OF DNEPR RIVER POLLUTION

Kishinev SOVETSKAYA MOLDAVIYA in Russian 14 Sep 79 p 4

[Article by Candidate of Chemical Sciences V. M. Ropot, head of the laboratory of mineral raw material and chemistry of water, Institute of Chemistry, AN [Academy of Sciences] of MSSR [Moldavian SSR]: "Two Academies in Collaboration"]

[Text] The Academy of Sciences of Ukraine and Moldavia adopted a decision providing for the conduct of comprehensive scientific research work and experimental design work for protecting the Dnepr River basin.

V. M. Ropot comments on this subject.

In recent years the problem of maintenance of the ecological balance of the Dnepr River basin and the Dnepr estuary has become especially urgent. This is due to the growing importance of the Dnepr as a source of industrial, household and irrigation water supply for Moldavia and the western and southern regions of the Ukraine.

There has been an increase from year to year in the volume of Dnepr water encompassed in the circulation for industrial, agricultural, municipal and domestic needs. The water is of course polluted by the various components which may have a deleterious effect on the river fauna and flora if the discharges comprise wastes which have not been cleaned.

The modern methods of cleaning drainage waters are rather effective. However, the complexity of the composition of the wastes requires an improvement in the technology of cleaning. Moreover, the existing methods do not always allow for effective elimination of the pollution generated by the open reservoirs in conjunction with shower waters.

Thus, the scientists are faced with the extremely complex and urgent problem of developing more modern and more effective purification methods and reducing the cost of operation of the cleaning installations.

Many scientific institutions of Moldavia and Ukrainiania are engaged in study of the objective laws governing the formation of the water resources of the Dnepr, the underground waters of the basin, and the flora and fauna of the water reservoirs. Also engaging their attention is the task of compiling forecasts.

These groups have now decided to pool their efforts. They recently held a conference of representatives of the scientific centers of Kiev, Kishinev, Odessa and L'vov. This conference reviewed and approved a plan for scientific research work and industrial experimental work as well as the priorities and procedures for the introduction of the results of the scientific research findings. This program encompasses a broad group of problems, including the advanced training of personnel who will work as specialists on water problems.

The work done is, of course, only a beginning. The scientists of the two republics have set themselves the task of developing an effective complex of measures to prevent the pollution of the basin of the Dnepr River, the measures to be based on the most recent scientific data. I want to emphasize that this program, scheduled for implementation over a period of several years, provides for concrete measures which will be introduced with strictly specified time limits every year.

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## INSTALLATIONS FOR PROTECTION FROM FLOODS BUILT IN LENINGRAD AREA

Moscow EKONOMICHESKAYA GAZETA in Russian No 43, Oct 79 p 24

[Article by D. Aleksandrov: "The Leningrad Shield Against Floods"]

[Text] Every fall the Leningrad inhabitants follow with heightened attention the weather forecasts for the next 24 hours. Unlike the hydrometeorological service summaries published in many regions of the country, these reports give additionally the height of the waves in the Gulf of Finland and the maximum possible rise of the water in the Neva.

In its 276-year history the city has experienced more than 240 periods of floods. Included in this category are only the instances when the level of the water in the delta exceeds the Baltic Sea level by more than 1.6 meters. Sixteen times during this period the water rose above the 2.5-meter mark. The city endured this recurrent experience quite recently--14 September of the current year, when the Neva rose to the 1.87-meter mark and overflowed its banks.

The people of Leningrad have learned how to cope with natural calamities. A special commission has been set up in the Leningrad gorispolkom and it is now functioning in situations of this kind. It coordinates the efforts of the plants, factories, institutions and organizations. But every flood, even a minor one, creates a tense situation in the city. The enterprises and organizations located in the low-lying part of Vasil'yevskiy Island have especially suffered from these floods.

This is why the people of Leningrad received with enormous satisfaction the CPSU Central Committee and USSR Council of Ministers decree on "Construction of Installations to Protect Leningrad from Floods."

The promulgation of this decree was preceded by a great deal of preparation. The principal work, including the technical plan, was accomplished by the Leningrad branch of the Cidroprojekt [All-Union Planning, Surveying and Scientific Research] Institute, which has a wealth of experience in the development of large hydrotechnical installations. Because of the diversity and scope of the problems to be resolved in the plan, 52 specialized planning

and design and scientific research institutions were recruited for the work of developing this plan. About 20 scientific institutions carried out wide-ranging research pertaining to environmental protection and to the preparation of a forecast of the hydrological cycle and the sanitary status of the Neva and the Neva bay.

In their study of the causes of the floods the scientists and specialists determined that they occur as a result of the complex interaction of the meteorological and hydrological processes which operate in the Baltic Sea and the Gulf of Finland. These processes result from the disruption of the equilibrium of the water masses and the formation of the giant wave after the cyclone has passed from the water reservoir to the dry land. In combination with the high wind it causes sharp rises in the level of the water in the eastern part of the Gulf of Finland and the Neva delta. Also, as the giant wave moves toward Leningrad the crest continually expands as a result of the contraction and diminution of the depth of the gulf. The characteristic features of the inundating floods are the suddenness, short duration, and great intensity of the rise and fall of the water level.

As far as the suddenness is concerned, with modern technology and means of communication it is possible to learn about the approach of the giant wave in advance. On a number of islands of the Gulf of Finland, in Tallin and in Narva they have set up special observation stations and have organized efficient systems of forecasting and reporting. The duration of a flood is estimated as several hours and, according to the statistical data, does not exceed 20 hours. The intensity of the rise and fall of the water level fluctuates from several centimeters to one meter per hour and even more. The Gulf of Finland also empties up to 100,000 cubic meters of water a second into the Neva bay while the long-term output of the Neva River comprises 2,500 cubic meters a second. The inundating floods are accompanied by a storm wind which attains a velocity of 30-40 meters a second.

#### Selection of an Optimum Variant

The selection of an optimum variant for the protective installations was preceded by an extensive complex of theoretical natural and model research. For corroboration of the technical plan, the All-Union Scientific Research Institute of Hydraulic Engineering imeni Vednyev built an enormous spatial hydraulic model. It reproduced the most important large-size sectors of the water reservoir under study--the Neva bay and the eastern part of the Gulf of Finland, including the protective installations. Six other models were used for study of the water-carrying and ship traffic installations.

The Neva bay, which, along with the protective installations, is the chief object of the research, is a shallow, semi-inland basin. Through the discharge of the Neva, the water in the bay undergoes full replacement on an average of every 5-6 days. Periodically water masses come in from the Gulf of Finland but they circulate over a distance which does not exceed 5-8 kilometers.

When the layout of a dam was to be determined, a study was made of some of the groupings of the installations. Changes were also made in the position and dimensions of these installations. The studies indicated that the protective installations in open water-carrying and ship-traffic inlets do not have any adverse effect on the hydrological and sanitary system of the Neva bay. Nor do they affect the reproduction of the fish reserves or disrupt the migration routes of the fish.

Along the southern and northern shores of the Neva bay near the protective installations steps have been taken to improve the flow as against the natural conditions. Whereas at present the water in the Strel'na region sometimes stagnates and in the summer occasionally begins to "mildew," the maneuvering entailed in the opening and closing of the gates of the water-carrying installations makes it possible to control the flows within the enclosed reservoir and also to provide for periodic intensified washing of the various sectors.

It should be noted that the protective installations provide all the necessary conditions for normal functioning of sewer systems and continuous operation of the main city cleaning installations on Beloostrov. Studies have shown that to the west of the protective installations at the span openings closed by gates the maximum level of the floods is somewhat higher and right at the installations is not more than .3-.5 of a meter.

#### The Special Features of the Installations

The complex of installations for the protection of Leningrad, which makes possible isolating the Neva bay from the Gulf of Finland when there is a threat of flooding, was planned in a line going from Gorskaya settlement--city of Kronshtadt--city of Lomonosov. The length of this route is 25.4 kilometers, including 22 kilometers for the gulf reservoir.

The route line selected has favorable engineering, geological, hydrological and topographic features. It is the best means of meeting the water-transport, construction, ecological and economic requirements and it conforms to the general plan for the development of Leningrad, the cities of Kronshtadt and Lomonosov, and the settlements of Gorskaya and Lisiy Nos. The route meets the requirements for the building of a high-speed motor road of the first category.

The complex includes 11 stone and earthen dams and two ship traffic and six water-carrying installations. The width of the spans for the ship traffic installations will be 200 meters and 110 meters respectively. Each water-carrying installation will have 10-13 openings 24 meters wide.

The specifications for operation of the protective installations prescribe that whenever the water accumulates in the Neva bay and its outlets in the river delta to a level of 1.6 meters, the spans and openings are in the open position. The gates of the ships and water installations close within 30

minutes right after receiving a forecast of a possible rise of the water level in the Neva delta above this level.

The protective dams have firm stone blankets and a wave-repelling wall which rises to a height of eight meters above the sea level. The type and design of the protective dams were adopted so as to allow for the use of building materials from the local quarries and for following the recommendations of the scientific research organizations. Along the crown of the dams they have built a motor highway with six traffic zones, which is part of the exterior circumferential highway around Leningrad. Under the navigable canals the motor highway goes through tunnels and the water installations cross reinforced cement bridges.

It was decided to accomplish the construction from three directions--from the city of Lomonosov, from the settlement of Gorskaya and from the island of Kotlin, where the city of Kronshtadt is located.

The establishment of the complex of protective installations is an integral part of the general plan for development of Leningrad and an important measure for improvement of the city and the city seaside zone. It is preventing the serious physical damage which the floods inflict on the city economy and the industrial enterprises of Leningrad. It is creating the conditions for improvement of the hydrological system and sanitary status of the reservoir of the Neva bay by redirecting the flow of the river. It is making it possible to utilize the depressed seaside territories of the city for the location of new housing construction.

As we know, the general plan for the development of Leningrad calls for an egress from the city directly to the shores of the Gulf of Finland. A great deal has been done in the last few years in this regard: sand is being deposited in the low-lying swamp sectors linking up the islands of Vasil'yevskiy, Dekabristov and Vol'nyy. Intensive housing construction is being carried out on the resulting territory. However, the bringing in of sand is a lengthy and expensive project. Consequently, the concluding stage of the shaping of Leningrad's maritime facade will be possible after the completion of the construction of the protective installations.

And finally, the complex of installations protecting Leningrad from floods is generating a motor transport crossing connecting the shores of Neva bay through the island of Kotlin. This crossing will then close the circumferential highway around Leningrad, thereby freeing the city streets from through transport, particularly truck transport, and making the city's air basin more healthful. Construction has already begun on some sectors of the highway. Now nearing completion in the area of the settlement of Mar'ino is the construction of a new bridge across the Neva; it will also be incorporated in the circumferential system.

Most of the planning and design solutions of the technical plan for protecting Leningrad from Floods are new and progressive ones which embody the

latest achievements of domestic and world science and technology. It is anticipated that the construction of the protective installations will be completed in 1990. According to the estimates of the economists, the operation of these installations will repay all the construction outlays in less than six years.

The CPSU Central Committee and USSR Council of Ministers decree on "Construction of Installations to Protect Leningrad from Floods" is striking evidence of the party and government's concern for improvement of the life and welfare of the people of Leningrad.

7962  
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## MEASURES TO CHECK MOSCOW AIR POLLUTION DESCRIBED

Moscow MOSKOVSKAYA PRAVDA in Russian 1 Sep 79 p 3

[Article: "Clear Skies Above the City"]

[Text] Friday, 31 August. The aerial laboratory designed to record the level of air pollution completed its first run over the city. This type of research will be conducted within the framework of the "Atmospher" experiment launched in the capital.

The city and the environment; man's industrial work and nature. For a long time systematic work has been in progress in Moscow in regard to restoration of the environment. Protection of the air reservoir occupies an important place in this program. A complex of new tests--dubbed "Atmosphere" experiment by the scientists--is for the first time carried out within the framework of the entire gigantic city. In terms of the scope and complexity of the task, the unique experiment is unparalleled. The complex program, in accordance with which specialists from various fields are conducting tests, is being implemented under the guidance of the USSR State Committee for Hydrometeorology and the Control of the Natural Environment. More than 40 academic and industrial institutes, scientific-industrial associations and enterprises, and leading universities are participating in this program. Ground observation posts and laser installations are in operation, and many atmospheric strata are being checked by aircraft.

The extensive project, which is intended to clean up the air reservoir above the capital, begins with observation and checking.

"Every day, the Central High-Altitude Hydrometeorological Observatory receives data from the observation network which consists of approximately 50 posts," says A. Makarova, division head of the State Committee for Hydrometeorology. In many parts of Moscow, one encounters silvery pavillions equipped with masts--at Komsomol'skaya Square, at Kolkhoznaya Square, in Ostankino, on Marshal Zhukov Avenue and on Varshevskiy Boulevard. These pavillions contain sensitive instruments that catch the most minute changes in the chemical

composition of the air and that register the presence of noxious substances in the atmosphere. The data received from the observation posts are processed by the observatory's staff members.

In addition to the stationary observation posts, there are in operation mobile "Atmosphere" laboratories designed for checking for atmospheric pollutants in the industrial zones of the city, a large industrial center. Starting this week, the project includes aircraft as well. The laboratory in the "IL-14" aircraft, which was equipped by specialists of the Institute for Applied Geophysics, will effectively help to register the degree of air pollution over the city. Through the 2-year "Atmosphere" experiment, it will be possible to study the effect of the capital's industry and transport on the air reservoir's purity.

Separate instruments are insufficient for checking the atmosphere's content of noxious substances. It is necessary to establish a reliable observation system utilizing the most advanced technical resources. Such a system is already being developed: The Automated System of Observing and Controlling the State of the Environment--ANKOS-A (Atmosphere).

Through ANKOS-A, it will be possible to conduct the observation work around the clock and effectively to respond to a potential rise in the level of permissible concentrations of pollutants. It is planned to examine the "quality" of the natural environment not only in the industrial areas, but also in the center of the capital, in the residential tracts, the green zones, the city environs--at a distance of up to 150 kilometers.

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## MINSK PURIFICATION COMPLEX IN OPERATION

Moscow IZVESTIYA in Russian 10 Oct 79 p 3

[Article by A. Vysotskiy, director of the Minsk Eleventh State Bearing Plant: "The Effect of Purity"]

[Excerpt] In 1968, on the basis of data supplied by the "Belkommunprojekt" Institute, a plan was drafted for electrocoagulation-treatment installations. In 1971, there was built and put in operation a facility--the first in our country--for the purification of the plant's entire industrial wastewater by means of electrocoagulation. Since 1972, after complex testing and adjustments, the facility has been operating under stable technical conditions.

The complex of electrocoagulation-treatment installations consists of a pumping station, power supply facilities, two vertical precipitation tanks with built-in electrocoagulators, a power supply system and a piping system.

All in all, the complex occupies no more than 0.16 hectares. The construction costs totaled R 160,000, while the consumption of power for the purification treatment amounts to 0.2 kilowatt-hours per cubic meter. In 24 hours, the complex purifies 5,000 cubic meters of water and it can be serviced by a single worker.

The complex of treatment installations allows to include in the system of circulating water supply all the polluted industrial wastewater that has passed treatment and to discontinue its disposal into open reservoirs. In addition, the plant reduced the consumption of fresh industrial water needed in production to approximately one-fifth of the previous level. During the time that the complex has been in operation, we "caught" and returned to the national economy over 3,000 tons of petroleum products. But for our complex, they would have gone into the Svisloch' River. The primary cost of treating 1 cubic meter of wastewater amounts to 4.2 kopeks.

The plant's capital expenditures per 1 cubic meter of water--in relation to the installations' productivity per 24 hours--total R 32 (I would like to point out that for water treated with reagents the capital expenditures per

1 cubic meter total approximately R 300). In addition, the electrocoagulation installations are distinguished by reliability and compactness. They can be fully automated. And there is yet another advantage: Purification by means of reagents results in a sharp increase in the water's mineral content, which complicates the water's inclusion in the circulating water supply system. In the electrocoagulation process, this can be avoided. The purified water is in no way qualitatively inferior to the fresh industrial water received by the plant.

More than 500 representatives of various enterprises and planning organizations of our country acquainted themselves with our know-how in operating water treatment installations. They not only acquainted themselves--many of them are building treatment complexes similar to ours. Similar stations are already in operation at a Minsk refrigerator plant, at the Moscow ATE-1 Plant, at a Leningrad carburetor plant, and other enterprises.

However, it would be wrong to claim that through putting in operation our electrocoagulation-treatment installations we solved all of the problems concerning protection of the environment. The plant's present circulating water supply system does not meet all of our water requirements. And the water is for the most part used for cooling equipment. It will be necessary to raise the quality of the treatment and to solve the problem concerning utilization of the circulating water for pickling, oxidizing and other technological processes.

There is yet another unsolved problem: The neutralization of waste process solutions. This type of wastewater comes into the station untreated, thus disrupting the operating routine of the treatment installations and reducing the quality of the water treated. Also, there have come to light several construction deficiencies of the treatment installations themselves.

All this necessitates reconstruction of the plant's present treatment installations and of the circulating water supply system. In this regard, we are awaiting effective support from the principal planning agency--the Kuybyshev branch of the VNIIIPP [All-Union Scientific Research and Industrial Design Institute of the Bearing Industry] and from the regional planning institutions--"Belpromprojekt" and "Avtoremprojekt."

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## SHORTCOMINGS OF KIEV CAMPAIGN AGAINST AIR POLLUTION BY MOTOR VEHICLES

Kiev RABOCHAYA GAZETA in Russian 27 Oct 79 p 4

[Article by A. Geletko, inspector with the State Motor Vehicle Inspectorate of the Ukrainian Ministry of the Interior: "For Clean Air"]

[Text] In the capital of the Ukraine, a great deal is being done to reduce the air pollution caused by automobile exhaust. A network of monitoring and diagnostic centers has been set up for adjusting the engine, and testing them for toxicity of the exhaust fumes. There are public reviews of the struggle against environmental pollution. The environmental protection measures are under continuous supervision by the State Motor Vehicle Inspectorate. During the first 6 months of this year, the inspectors barred over 1,000 motor transport units from being operated.

As yet, however, not nearly enough is being done in this direction. As was shown by the joint road inspections conducted by the State Committee for Environmental Protection, the Municipal Medical-Epidemiological Station, the Industrial-Medical Laboratory of the Motor Transport Ministry of the Ukrainian SSR, and the Ukrainian Ministry of the Interior, many motor vehicles from the motor pools of the republic's capital are still being driven with nonadjusted engines that pollute the air.

This negative phenomenon is caused by many factors: The establishment of new diagnostic centers is progressing at too slow a pace and centers already equipped are not being utilized. For example, at the ATP-1 [Motor Transport Center] of the "Kievgorstroytrans" [Kiev Municipal Construction Transport] concern of the Kiev Main Administration of Municipal Construction, the diagnostic line has been under construction for more than 2 years. The directors of the Kiev Administration of Passenger Motor Transport are not greatly concerned about the lack of diagnostic stands at the ATPs 09104, 09111, 09124, and 09125, or about the idling of the express-diagnosis line installed at ATP-09121.

Then there are the hundreds of privately used motor vehicles of the workers of the Kiev Technical Auto Service, which are not inspected.

At the enterprises of the Ukrainian Ministry of Communication and the Ukrainian Ministry of Health, there are only formal motor transport checkups. The workers entrusted with checking the toxicity level of the fumes are insufficiently trained; some are even unfamiliar with the current norms of the All-Union State Standard.

The workers of the Kiev Motor Vehicle Base No 1 of the Ukrainian Ministry of Industrial Construction likewise considered it unnecessary to familiarize themselves with the norms. Thus, a large number of means of transport are dispatched with their engines nonadjusted.

At the above-mentioned motor vehicle enterprises, there is a lack of any kind of vivid propaganda aimed at preventing air pollution caused by motor vehicle exhaust. Insufficient consideration is given to propaganda concerning this important matter and to educational work with drivers, repair workers, and engineering and technical personnel. The collectives of these and some other motor vehicle enterprises are quite out of touch with the problems concerning the campaign against noxious fumes in the environment. In the summing up of socialist competition, the environmental protection work is not taken into account.

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## USING CHEMICAL BY-PRODUCTS INSTEAD OF DISPOSING OF THEM

Moscow IZVESTIYA in Russian 21 Oct 79 p 3

[Article by V. Rykov, candidate of technical sciences and director of the Volzhskiy Organic Synthesis Plant, Volgogradskaya Oblast: "Economy As Well As Benefit"]

[Text] Recently, at a plenary session of the Volgograd CPSU Oblast Committee, the discussion revolved around competition under the motto of "working without laggards." After I had talked about some production achievements (it should be pointed out that our production is impressive: the plant is the only one in the country to obtain large quantities of organic sulfur), members of the presidium asked me whether our undertakings improve the atmosphere or whether they pollute it.

Naturally, the question was not asked to make me return to the platform and start my account all over again--this time from a different point of view; rather, it seemed to express the wish that in my next talk about our enterprise I not so neatly separate the production work of the chemists from their concern about cleaning up the environment, but consider them in their entirety as a unified, social-industrial problem. But to answer to the point, we are not just talking; we are actually trying to increase production, while reducing environmental pollution.

Since 1975, the plant has been implementing a complex waste utilization program aimed at obtaining new valuable products. The central plant laboratory made a thorough analysis of all waste materials, determined their material value and proposed to search for ways of utilizing this waste for production. Participating in the testing were developers of new chemical processes from a number of academic and scientific research institutes. On the basis of operational, creative agreements, we established permanent, long-term relations with these scientists. I feel that an entirely correct solution has been found--the development of a plant-wide wastefree technology.

Consider this example: Our plant was the first in the country to synthesize a very important product--methionine, an amino acid which is a constituent

of animal and vegetable proteins. Naturally, this is a great achievement for our national economy. Unfortunately, the production of methionine is a source of environmental pollution. The still residues of one of the semifinished products contain noxious substances; burning these substances, we polluted the air and inevitably lost a certain quantity of valuable substances.

Our laboratory has found a method of obtaining from the still residues a valuable product--dimethyl sulfide, which is used for producing another still more valuable product--dimethyl sulfoxide, a substance widely used in industry, agriculture and medicine. The plant succeeded in obtaining a high-quality dimethyl sulfide: Last year, it was awarded the state quality seal. These and other technological solutions in current production have enabled us to obtain R 4 million worth of valuable products. Moreover, 500 tons of chemicals are no longer dumped on the environment, but returned to the production process!

Another by-product of this production process is waste formalin. This is a rather "hard nut," since the toxic formalin is not absorbed by microbes. On the contrary, it kills them (and you know, there are many useful microbes in the soil). Formerly, we partially disposed of the formalin along with the waste. Meanwhile, we have learned that formalin is the starting material for obtaining many highly useful chemical products. In collaboration with scientists of the Nizhnevолжский branch of the Groznyy Scientific Research Institute, a technical process has been developed for obtaining from the formalin waste a new product--which is none other than rosin obtained synthetically.

Rosin is in great demand in the national economy. It is used in the tire industry, in the vulcanization of rubber, in the production of soap, lacquers and plastics, and for paper sizing. Our synthetic rosin easily replaces the rosin obtained from turpentine. In all of the fields mentioned, it is successfully used in our country in place of the scarce vegetable oils. You see, again a dual effect.

The plant researchers also suggested that methionine could become a starting material for the biosynthesis of lysine--another indispensable amino acid; to obtain lysine, they used--guess what--grain, i.e. corn from which they prepared a special extract. In collaboration with the A.N. Bakh Institute for Biochemistry of the USSR Academy of Sciences, our engineers developed a technical process for obtaining homoserine, which easily replaces that extract. Lysine is successfully used as an animal feed additive.

For a long time, the volume of our solid waste has been rather large. Through their research, our engineers established that this waste contains a wide range of amino compounds that are customarily used as stabilizers in the polymerization of synthetic rubber. And we used to burn this waste! In collaboration with scientists of the Dnepropetrovsk Institute for Chemical Engineering, we developed a method of obtaining from this waste one of the stabilizers used in the polymerization of synthetic rubber. We produced it and tested it at the Volzhskiy Synthetic Rubber Plant and the Volzhskiy Tire Plant: An

excellent product! You know what this means? If the state can stop importing the expensive diphenyl paraphenylenediamine, which is bought with foreign exchange, this will to some extent be due to our efforts.

In order to intensify and extend its work concerning the efficient utilization of industrial waste, the collective of organic chemists entered into collaboration with other work collectives. Until recently, we used to dump huge quantities of the solid waste produced by various shops. In collaboration with staff members of the Volzhskiy Synthetic Rubber Plant, we developed a fuel compound containing resins discarded by our enterprise as well as the so-called "green soap"--waste material obtained in the production of rubber. In regard to calorific capacity, the fuel obtained is not inferior to mazut [fuel oil]. It is produced in considerable quantities--5,000 tons per year.

With the aid of scientists from the Department of Chemical Engineering of Moscow State University, an application was found for the liquid tars obtained in the production of morpholine; from these tars, which formerly used to be dumped, we now obtain substances inhibiting the acidic staining of metals. Tests conducted at the Novolipetsk Metallurgical Plant and at the Nizhnetagil' Car Building Plant showed that in the course of 1 year use of the inhibitors in these two plants resulted in metal and sulfuric acid savings of several thousand tons per year.

This is only part of the work our collective is engaged in in regard to utilising the production waste so as to economize on raw materials and protect the environment. All in all, the complex of measures taken has enabled us to reduce the volume of wastewater by 500 cubic meters per day and the volume of exhaust gas--per 10 million cubic meters of combusted solid waste--by over 10,000 tons per year. In the past 4 years, the overall economic effect of using the waste materials in a secondary production cycle amounted to over R 20 million.

Is this much or little? It is a lot, of course. Nevertheless, a great many noxious substances still get into the reservoirs, the atmosphere and the soil. The work done in this respect is insufficient. From the waste obtained in the production of morpholine, we could obtain quite a few derivatives of that product. And where could these derivatives be used? Here I would like to express a wish. In this regard, there is not enough coordinated intra- and inter-departmental information. And such information must be developed. You see, sometimes valuable products are not utilised simply because it is not known that they are needed by somebody. Look at the dumps smoking away around our cities, darkening the sky and poisoning the air. And the substances burning here are for the most part valuable.

During the last few years, the Volga flowing past Volgograd and Volzhskiy has been truly clean. The air above these cities has become noticeably cleaner. In the vicinity of chemical enterprises, aluminum works, oil refineries and other plants, one now no longer sees stunted trees, and in the rivers, no white fish bellies washed to the surface. On the contrary, at the gates of

these enterprises, there are bright flower beds, and at the Volga one can see from the banks the young fish frisking about. These are convincing indicators of the changes in nature that have occurred thanks to the concern of the party and the government for the protection of the natural environment.

However, all these accomplishments are only the first step. We must take the next steps as well, especially in regard to reorienting the people's consciousness and thinking, their attitude toward nature. It is imperative that every industrial leader, every engineer, technician and worker be touched by the deep meaning of the words spoken by Leonid Il'ich Brezhnev during his stay at Dnepropetrovsk: "To preserve the purity of the earth, of the air and of the water is a national goal. There was a time when people tried to put a plant in operation as fast as possible, to produce at any price. Today we must build so as to protect nature. In addition, we must modernize old enterprises in order to prevent damage to the environment."

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TREATMENT AND UTILIZATION OF THE WASTE PRODUCED IN OIL REFINING

Moscow IZVESTIYA in Russian 12 Oct 79 p 3

[Article by A. Yershov, Gor'kiy correspondent of IZVESTIYA: "A Factory Producing Living Water"]

[Text] Driving to the oil refinery, one first crosses a dark, jagged forest belt; then there is the long stretch of the residential blocks of the young petrochemical city of Kstov. The plant is located at some distance in a large valley traversed by the meandering Kud'ma River. And the Volga brightly sparkles below the high, precipitous bank.

In the past, the plant had an unflattering reputation--it had scarcely been put in operation, when it almost became necessary to shut it down: The diverse waste it produced seriously polluted the air and the water. It is to the collective's credit that here a lot of energy has been expended toward modernizing the oil refinery in regard to technology, standards of production, and working conditions. V. Kondrat'ev, the director of the plant, stated:

"In our plant, we continuously put in operation new shops and redesign operating capacities. In this regard, the main emphasis is placed on introducing advanced know-how and the best results of scientific-technological progress, which helps further to improve production. In the last few years, we have considerably increased our output. The product assortment has been expanded. There is something else that is of great importance: The enterprise has implemented a whole complex of measures aimed at protecting the environment and preventing air and water pollution."

The plant has presently established a special division for the protection of the natural environment, which is headed by M. Denisov, deputy chief engineer. Z. Yemel'yanova, V. Voskresenskaya and others--experienced, knowledgeable specialists--have been working at the plant for many years. Various laboratories check the operation of numerous gas- and dust-collecting installations and electrofilters as well as the wastewater contents.

It should be pointed out that the plant consumes a lot of water, which is needed for purifying the oil, its subsequent refinement into gasoline, diesel

fuel and industrial oils and also for the cooling of various types of equipment and finished products. However, a basic difficulty lies in the fact that in keeping with current technology the water in a number of installations comes into direct contact with the raw material and consequently gets heavily polluted by oil and paraffin residues. It is difficult to remove these admixtures from the wastewater so that it can either be used in repeated circulation or--after purification--dumped into the Volga.

Together with I. Kichigin, the director of the water supply and treatment installations, we inspected his complex and rather large department. In the shops, there operate sand traps and oil filters; deep in the ground, diverse pipes are laid out. All this must be kept in exemplary working order. At the plant, Igor' Aleksandrovich is called "master of all the waters." He graduated from the Department of Water Supply and Drainage of the Gor'kiy Institute for Civil Engineering. Upon arriving at the plant at the height of construction activity, he started the shops. The plant kept growing and along with it--in his capacity as specialist--grew Kichigin. He is satisfied with his present work and even takes pride in it: A lot of good and--from an engineering point of view--interesting things are happening in this somewhat "nonprestigious" section!

For example, there is the biological purification station. Strictly speaking, it is a little town of diverse installations, spreading outside the plant site. There is the huge concrete "saucenpan"--nearly 30 meters in diameter--in which a slowly turning scraper skims all kinds of scum from the water, dumping it into a special trough. Nearby, in an oblong concrete installation, the so-called airtank, powerful jets of air are blown from the bottom through the wastewater, saturating it with oxygen.

Here there are "at work" microorganisms visible only through a microscope. They are found in the so-called active silt that is introduced into the treated wastewater. Incidentally, in an ordinary river, these organisms--in absorbing the organic residues--easily transform them. The river purifies itself, as it were. And here, on account of the fact that man has created an especially favorable environment for the microorganisms, our little helpers' processes of vital activity are greatly intensified. As compared to conditions in nature, the purification of the water is 100 times as intensive. The biological treatment station is essentially an industrial process directed by man.

There is something else I have to mention. Igor' Aleksandrovich finally showed me the after-treatment ponds where the water recovers its properties and really becomes "alive." Before me, there extended a still, mirror-like surface; on the banks, reeds were forming a green wall. In these ponds, the station workers breed fish. The last carps they caught here weighed half a kilogram each. And you know, not long ago this water--emitting a characteristically heavy smell--was dead. It has now been fully restored to life. Such water is now returned to the Volga as well.

The continuous wastewater analyses carried out by the workers of the Verkhne-Volzhskiy Reservoir Inspectorate and the Medical-Epidemiological Station

confirm that the water-purification work of the oil refinery is proceeding under stable and reliable conditions. The people at the plant have long forgotten the stiff penalties that used to be imposed for polluted wastewater.

The plant's reliable, stable water treatment helped to solve yet another important problem. I am referring to the so-called repeated water circulation. The water used for technical purposes has to meet exacting requirements. Water of poor quality, with various admixtures, is unsuitable: In complex technical apparatus, there form harmful salt deposits and the technical process is disrupted. At the oil refinery, 97 percent of the water presently circulates, i.e. the bulk of the water continuously circulates in closed, linked technological systems; naturally, each time the water goes through the plant's preliminary purification installations.

Likewise of great importance is the fact that in the last few years the plant has done a great deal in regard to the change-over from water cooling to air cooling. At present, 169 installations and apparatus are operating under the new system. In the course of reconstruction, 114 of these installations were immediately equipped by the plant workers with powerful ventilators. All this enabled the plant to reduce water consumption by millions of cubic meters per year and, consequently, to reduce considerably the disposal of wastewater. The latest research fully confirmed the idea that just as important as setting up a good water-treatment system is trying to reduce as much as possible water pollution by various waste materials.

In the refining of oil at the various facilities, there are produced many so-called hydrocarbon gases that contain a whole "bouquet" of different, useful components. Formerly, these gases were for the most part used for fuel-related purposes. A lot of good substances were irretrievably lost. Moreover, the noxious waste gases heavily polluted the air. The plant has now installed a special facility for the reprocessing of these gases; here many additional valuable products are obtained. Until recently, there remained a sore spot in that due to the poor sealing of the joints of technical installations, the gases were not fully collected. On the other hand, it frequently happened that ordinary air was "sucked" into the gases, which lowered their quality and complicated the subsequent processing.

Thanks to the efforts of the office of the main power engineer, special log-books have been set up for each gas-related technical installation. In these logs, diverse observations are entered in the course of operation. In the regular repair and maintenance work, all this is assuredly taken into account. The equipment of the shops is now operating more reliably and evenly. As a result, it was possible to put an end to the various toxic trails, to the accidental gas blowouts. In the shops, the dust concentration presently does not exceed the sanitary norms. Thus it has been possible substantially to improve the working conditions of the people.

During the last few years, there has been a marked increase in gas reprocessing - and any technologically unjustified disposal has been totally discontinued.

Gas combustion by open flame has been reduced to a minimum.

A large plant for the production of ethylene and propylene is presently being built at the Kstov oil refinery. Essentially, this will be a "plant within a plant," equipped with the necessary powerful water unit and drainage system. It is gratifying that already at the planning stage in the construction of the new petrochemical complex, the foundations were laid for the most modern, efficient facilities that will ensure successful production work. No less important is the fact that these facilities will offer reliable protection against environmental pollution. And even though such installations are very costly, the state is supportive.

At the same time, the plant has difficulties as well. The first treatment installations were put in operation here almost 20 years ago. Some of the facilities are in need of modernization and technical reequipment. For example, the plant's precipitation ponds are of the open type, the main shortcoming of which is the heavy evaporation of the wastewater during purification. Moreover, the ponds occupy a total of 8 hectares--an excessively large area. Meanwhile, there has been developed a different design for such installations--closed, semisubterranean facilities. Naturally, such an arrangement is more compact and the technological process is more easily controlled. A project of this type is presently being established at the plant. Obviously, the plant must be given the necessary material and financial support to ensure speedy construction of the vital facilities.

At one time, the construction workers delayed introduction of a new productive airtank at the biological treatment station. Naturally, the production workers are trying to get maximum use out of the existing airtank, but they need reserve capacities as well. For with the enterprise being expanded, the treatment capacities must be expanded far more rapidly. The construction workers of Glavvolgovskyatstroy Concern No 5 must take measures to ensure the speedy commissioning of that vital facility and to create all the conditions necessary for normal operation of the plant.

In the shops of the oil refinery, everyone is called to account, without any exceptions: Is the air polluted through your fault? Are the waste materials exceeding the established norms? And in the event of deviation from the norms, the most drastic measures are taken. Specifically, under the conditions of socialist competition, economic penalties are stipulated on this score. If the quantity of waste materials deviates from the norm, the shop collectives--even if they have attained high production figures--are out of the plant competition. Precisely such penalties had to be imposed at one time on the shop collectives No 1 and 7, in which the disposal of waste into the sewage had exceeded the norm.

In a recent speech delivered in Dnepropetrovsk, comrade Leonid Il'ich Brezhnev, general secretary of the CPSU Central Committee and chairman of the presidium of the USSR Supreme Soviet, stated: "To preserve the purity of the earth, of the air and of the water is a national goal. At one time, people tried to put

a plant in operation as fast as possible, to produce at any price. Today we must build so as to protect nature." The example of the Novogor'kiy Oil Refinery convincingly shows that through a skillful, thrifty approach it is possible to combine great production efficiency with reliable environmental protection.

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## SHORTCOMINGS IN TRAINING OF ENGINEERS

Moscow EKONOMICHESKAYA GAZETA in Russian No 43, Oct 79 p 17

Article by Rector of the Moscow Institute of Chemical Technology imeni D. I. Mendeleyev G. Yagodin, Professor V. Zaytsev, deputy chief of a department of the State Committee for Science and Technology A. Tsygankov: "Who Is in the Defense?"

Text Solid, liquid and gaseous wastes attack nature and at times, unfortunately, win. The environment requires reliable, highly skilled protectors. It is gratifying to note that their regiment is being added to with each year.

Institutes of construction engineering, for example, the Moscow and Leningrad institutes, are training engineers in water treatment and water purification. Specialists in the recovery of secondary materials of industry are being trained at eight higher educational institutions, including the Moscow Institute of Chemical Technology imeni D. I. Mendeleyev. Faculties for the retraining of engineers are in operation at several higher educational institutions, including the Leningrad Technological Institute of the Pulp and Paper Industry and the Rostov State University.

At the same time the ecological training of engineering and technical personnel, in our opinion, needs serious improvement. This concerns first of all the graduates of technological specialties, for the development and proper operation of ecologically safe industrial works are within only their capability. Today, unfortunately, far from every technological course is permeated with the idea of the need to create no-waste processes.

Apparently, courses or, in the last resort, sections of courses, which are devoted to the principles of no-waste technological works, should be introduced for a number of specialties, for example, chemical technological and metallurgical specialties, and special textbooks should be developed. This is possible especially as extensive material on no-waste technology has already been gathered and generalized, several all-union and international conferences on this theme have been held. This year the All-Union Conference on Problems of the Designing and Introduction of No-Waste Industrial Works

was held in Grodno, and the draft of the Main Statutes on the Planning, Designing and Operation of No-Waste Technological Systems was discussed in the State Committee for Science and Technology.

A refresher course in questions of no-waste technology could be organized, in particular, at the Moscow Institute of Chemical Technology imeni D. I. Mendeleyev, where the appropriate personnel are available and a number of modern no-waste technological processes (the obtaining of devitrified slag glass, the use of wastes in the production of cement, the obtaining of fluorides in the production of phosphorus fertilizers and others) have been developed.

You would not call the state of affairs with the training of chemical technologists in the specialty "the technology of recovering the secondary materials of industry" anything by paradoxical. In recent times difficulties with their placement have arisen, but it should be just the opposite: the amount of wastes being treated is increasing intensively. The point is that these specialists in practice are not acquainted with the processing method of the basic chemical works. It is simply impossible to be a specialist in gas and water purification and the partial treatment of solid wastes (toward which the graduates of this specialty are mainly oriented) without knowing the main processing method, since for each enterprise these questions are very specific and depend first of all on the used processing method. Need one be surprised that enterprises do not hurry to hire such "narrow" specialists?

It is necessary to expand the profile of the specialty, and not only in the interests of chemical enterprises, but also of plants for the treatment of sewage, more and more of which are being built. For the present not one higher educational institution, as strange as this may be, is training engineering and technical personnel in the technology of sewage treatment. It seems that it is time for the USSR Ministry of Higher and Secondary Specialized Education and the RSFSR Ministry of Housing and Municipal Services to deal immediately with this question.

The graduates of higher technical educational institutions, including specialists in recovery, should also know if only the principles of the economic evaluation of the harm from the effect of industrial waste on the environment and should be able to predict the influence of economic activity on nature. Officially approved methods in this respect already exist, students should have a clear idea about them.

Difficulties also exist with the training of specialists of the highest qualification (candidates and doctors of sciences) in the area of the protection of the environment against industrial waste. In the list of scientific specialties we find the specialties "the rational use of natural resources and nature conservation" and "ecology" in the geographical, biological, economic, agricultural and medical sciences. Unfortunately, there is no such specialty in the technical and chemical sciences.

At one time when examining the list it was suggested that the questions of purifying discharges and recovering wastes belonged to each of the specialties, but in practice they have undergone independent development. Moreover, it turned out that the purification of gases with the recovery of waste in the chemical industry has much in common with similar processes in ferrous and nonferrous metallurgy. The situation is the same with the purification of sewage and the treatment of solid wastes. With allowance made for this, in our opinion, it is advisable to introduce a new scientific specialty, for example, "the technology of the purification, treatment and recovery of industrial, agricultural and municipal wastes," with the conferring of academic degrees in the technical and chemical sciences.

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ABSTRACTS

LASER LOCATORS MEASURE URBAN ATMOSPHERIC POLLUTION

Leningrad VECHERNIY LENINGRAD in Russian 9 Oct 79 p 2

[Author: Sergeyev, A.]

[Abstract] The article reports on a laser locator [lidar] for long-distance measurement of atmospheric pollution. The author witnessed a test of this instrument, which was located on top of a building in one of three experimental lidar stations of the Leningrad Scientific Research and Planning Institute of Urban Development. Commenting on the instrument, A. I. Melua, head of the institute's space and laser research sector, noted that the lidar gives complete, reliable information on the spread of pollutants over large cities. This information has practical value for purposes of city planning. Melua said that the institute's three stations in Leningrad are sufficient to cover the entire city. Operated in sequence, they provided data on the city's air basin from ground level to an altitude of 2000 meters. Specialists of the institute have completed preliminary work on plans for setting up a computerized lidar information service (ALIS) in Leningrad.

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## BRIEFS

NOISE ABATEMENT MEASURES--Yerevan (TASS)--At one of Yerevan's busiest cross-roads, the noise level has been considerably reduced: In the city, an underground motor vehicle route has been opened. It was built according to the recommendation of specialists of the Acoustics Laboratory of the Armenian Scientific Research Institute for General Hygiene and Occupational Diseases. With due regard to the special characteristics of motor transport, the experts developed proposals that were incorporated into the overall urban development plan. A number of principal thoroughfares have already been rebuilt. Heavy-load trucks have been banned from individual sections of city streets. Construction of underground crossings is proceeding at a fast pace. [Text] Moscow PRAVDA in Russian 16 Oct 79 p 3] 8760

WASTEWATER TREATMENT BY COMBINES--Minsk--In regard to environmental impact, cellulose-paper combines may soon become the cleanest enterprises. This is the opinion of the scientists of the Institute for General and Inorganic Chemistry of the Belorussian Academy of Sciences and of the Belorussian Technical Institute. They have developed a reliable and at the same time very simple method of treating the wastewater of the paper industry. They did not invent any complex chemical reagents, but proposed to use cellulose as a filter. After special treatment, the cellulose acquires the capacity to extract noxious admixtures from the water. Having served its term, the one-time filter returns to the combine shops where it is converted into the customary paper. TASS correspondent D. Patyko acquainted himself with the results obtained in the experimental testing of this method. According to Patyko, the technical process advanced by the scientists makes it possible fully to convert the enterprises of the sector to a system characterized by circulation of the water supply. [Text] [Tallin SOVETSKAYA ESTONIYA in Russian 16 Sep 79 p 1] 8760

ENVIRONMENTAL DAMAGE BY CONSTRUCTION--Nemchinovk, Moskovskaya Oblast--Eight years ago, on the outskirts of the settlement of Nemchinovk, construction work started on a motor vehicle service station beyond the circuit highway. The first thing the construction workers did was to move the bulldozers all over the springs that feed the Nemchinovk pond. Then they began to dump untreated wastewater--approximately 50 cubic meters per day--into the reservoir. Moreover, the petroleum products spilled on the construction site and the

loosened soil that were washed away by rain and melted snow likewise thoroughly choked up our pond. At one time, this had been a recreation spot favored by the people of the settlement. Today the pond pretty much resembles a swamp. But it is here that the little Chachinka River springs forth--a tributary of the Moskva River that empties into the Rublev Reservoir. The Executive Committee of the settlement's Soviet has exhausted all means of influencing the directors of the construction project. In spite of our numerous representations and despite the reports drawn up by the Rayon Medical-Epidemiological Station and by the Inspectorate of the Moscow-Okskiy Reservoir Administration for Water Utilization and Protection, the dumping of waste continues. To be sure, comrade Gus'kov, the director of the motor vehicle service station's unified management, promised to include in the 1980 plan operations concerning cleanup of the pond. However, it is hard to believe in these promises. This is not the first year that we have heard such promises; nevertheless, the serious violations of USSR water laws continue. [Text] [Moscow IZVESTIYA in Russian 4 Oct 79 p 3] 8760

POLYMER FILTERING POWDER--Khar'kov--They were able to get by without the construction of additional tanks for industrial waste treatment at the Khar'kov Tractor Plant, which is rapidly increasing its capacities. A new method of filtering waste water--using polymer powder--was adopted here on the recommendation of scientists. Like a sponge, it soaks up any impurities and absorbs tens of times more of them than the sand which was used for this purpose. The porous polymer is easily cleaned--it is sufficient to "wring" it with rollers. Now the waste being poured into the tank is rendered harmless five times faster. [Text] [Moscow MOSKOVSKAYA PRAVDA in Russian 18 Sep 79 p 1] 7807

VIL'NYUS ENVIRONMENTAL MEASURES--During the 10th Five-Year Plan 40 million rubles have been allocated for the improvement of the environment, the landscaping of Vil'nyus and the improvement of its sanitary condition. Much capital is also being used to control water and air pollution and noise. Thus, the first section of the waste treatment facilities of the city alone, which are being built, will cost approximately 13 million rubles. The state of nature conservation was discussed at the session of the City Soviet of People's Deputies, which was held in Vil'nyus on 26 September. First Deputy Chairman of the Gorispolkom K. Kachonas delivered a report. [Text] [Vil'nyus SOVETSKAYA LITVA in Russian 27 Sep 79 p 3] 7807

BONUSES FOR ENVIRONMENTAL PROTECTION--The USSR State Committee for Labor and Social Problems and the AUCCTU by Decree No 226/P 5 have established in all sectors of the national economy a procedure for the payment of bonuses for the fulfillment of the plans and measures on nature conservation and for the observance of the norms and regulations of the use of natural resources. The managerial personnel of enterprises and organizations (directors, managers, chiefs, their deputies, chief engineers), as well as other workers, who are guilty of the nonfulfillment of the plans and measures (including on the placement of waste treatment facilities into operation), are deprived of the bonuses for the main results of the economic activity in full or in part. They are deprived of not less than 25 percent of the bonus for the nonfulfillment of the established plans and measures according to one or more indicators. The guilty parties are deprived of the bonus in full for the nonfulfillment of the plans and measures on nature conservation, which are specified

by the state plans of USSR economic and social development, henceforth until these plans and measures have been implemented. [Text] [Moscow EKONOMICHESKAYA GAZETA in Russian No 42, Oct 79 p 22/ 7807]

SPACE PHOTOGRAPHS AID OIL POLLUTION STUDY—Oil films on the surface of the ocean are visible in photographs taken from outer space. Scientists are learning how to recognize such films at a great distance and to evaluate their size, thickness and composition as well as the direction and speed of their drift. All of these problems are being studied by Leningrad researchers at the Institute of Oceanology imeni Shirshov of the USSR Academy of Sciences, and at the hydrometeorological and oceanographic institutes. Representatives of these institutions are telling of the results of their work at an all-Union conference currently in progress in Baku. Afloat in the Caspian Sea Leningrad scientists carried out studies connected with the development of long-distance methods of monitoring oil pollution. Such oil films are a threat to the northern seas as well, particularly in the autumn-winter period. They can exist for a very long time there, since their natural breakdown proceeds very slowly owing to the relatively low temperature of these waters. [T. Sanina] [Excerpt] [Leningrad LENINGRADSKAYA PRAVDA in Russian 30 Oct 79 p 4]

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CYPRUS

GOVERNMENT SWAMPED BY ENVIRONMENTAL PROTEST

Nicosia THE CYPRUS WEEKLY in English 12-18 Oct 79 p 2

[Text] The government was swamped this week by protests from various groups, complaining about pollution and the destruction of the environment.

The protests are coupled with warnings about the threats faced by the islands lucrative tourist trade by certain projects.

One of these warnings came from Mr Ch. Christofides, the Independent member of the House of Representatives for the Larnaca District. He told a press conference at Larnaca on Wednesday that the whole Larnaca beachfront, from the marina to the airport is endangered by total pollution as a result of the disposal of sewage and other wastes into the sea.

Dismal Constructions

Furthermore, Christofides added, the beaches are being cluttered by dismal makeshift constructions. Though these are erected illegally the authorities are doing nothing about it, he complained.

The Larnaca MP said that already many bathers using the Larnaca beaches were affected by streptococcus and staphylococcus, both serious skin diseases, during the summer months, "possibly as a result of the polluted sea water."

"Continuing indifference may have grave repercussions on the health of the people, the increase of tourist traffic to our island and on the future of the many hotels that exist or are being built along the otherwise so attractive Larnaca beach," he added.

An announcement by the committee stated it was both highly dangerous and unacceptable that "there are still cases of hotel and industrial units that dispose of their sewage directly into the sea."

### Unsatisfactory Hygiene

In general, the committee states, "the general hygienic services and the cleanliness of the town are not at all satisfactory and this does not help tourist development."

The Akel committee points out this is the "umpteenth time" it has protested about the situation.

Another environmental protest came from the Paphos Committee for the Protection of the Environment and Tourist development. This protest complains about the failure of the foreign company owners of the Coral Bay complex to develop the area properly and calls on the government to undertake the task itself.

The current development of the lovely bay "ignores the character of the location and in no way contributes to the preservation of the environment," the protest said.

Finally Mr Thassos Ioannou, the Secretary of the Restaurant and Entertainment Enterprises Employers Association also complains about the undertaking of major tourist development projects on the island by foreign firms. He complained that the government should abandon its "present conservative attitude," with regard to tourist development and allow the opening of a casino and other attractive entertainment projects. But such a development should be strictly controlled to safeguard the environment and the right of the people to have unhindered access to the beaches, he added.

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**COPPER MINING FACILITIES ENDANGER ENVIRONMENT**

Istanbul CUMHURIYET in Turkish 22 Oct 79 p 6

[Text] This is the township of Goktas, the new name for Murgul, in Borcka District, Artvin Province. Murgul is stretched out along the length of a deep valley through which runs a stream by the same name, a corner of our land richly endowed by nature with forest growth. Murgul and vicinity consists of two deep valleys surrounded by high mountains. Tirial Mountain on the southeast (3,800 meters), the Balikli Mountains on the northwest (2,000 meters), create a narrow basin which stretches to the Coruh River back from the Black Sea coastal lowlands. In this basin are the villages of Damar, Petek, Kure, Baskoy, Ozmal, Erenkoy, Bucur and Suluklu, which are connected to Murgul. The cultivated lands belonging to these villages are situated on the slopes on either side of the Murgul and Baskoy rivers wherever suitably level sites can be found and these fields range from 420 meters to 1,100 meters above sealevel. The main ore deposits of the Murgul copper plant and its ore production facilities are 9 kilometers from Murgul in the village of Damar. Its other facilities are in Murgul itself.

**Murgul, An Inferno of Poisonous Gases**

Essentially the character of the climate and the geographical conditions in Murgul are extremely favorable for cultivation. Whereas natural vegetation formerly abounded on all sides, today, due to the impact of poisonous gases which are emerging from factory chimneys, this natural cover has disappeared from place to place.

Prof Hayati Celebi of the Department of Soil Science in the Agricultural Faculty of Ataturk University presents the situation in this district in the clearest manner on the basis of studies which have been made of Murgul. Dr Celebi included the following points in his report on this matter:

It has been determined that the poisonous gases ( $SO_2$ ) which have been spread throughout the Murgul area from the factory smoke stacks have been harmful to the natural and cultivated vegetation over a very wide area and this situation has also led the way to soil erosion. In some villages which are situated quite far from the township center where the factory has been

established, for instance, in Petek, Damar, and Kure, the damage which the gases have done to living things has been extensive. From the aspect of erosion, the lethal effect of sulfur dioxide gas on living plant cover is significant. As is known the principal causes of erosion are the destruction through various means of plant cover in the area and its removal. So it is in Murgul that the hillsides have become generally bare as a consequence of the SO<sub>2</sub> gas and also because of habitual misuse of the land by the population there (forest cutting, forest fires, cattle grazing, uninformed cultivation practices, etc). Landslides everywhere have created deep scars on the hillsides.

Erosion studies in the vicinity of Murgul show that the fields have lost soil to a frightful degree. The fields have now lost their vitality and are surrounded by naked and useless hillsides. If the effect of the sulphur dioxide gas cannot be rendered harmless, erosion will accelerate and in the near future problems will arise which will be impossible to resolve.

Another reason contributing to the pollution of the soil in Murgul is the fact that the water from the town now flows into the Murgul River. The stream is not only harmful to the health of persons and animals it is also lethal to cultivated crops when used for irrigation purposes.

In the light of Professor Celebi's report, the Murgul inferno is as follows: The existence of the Murgul copper ore deposits reaches back to ancient times; it is said that they were even worked by the Genoese. These deposits, which passed into the hands of the Russians following the 1878 war between the Ottomans and Russia, were subsequently turned over to an English firm and were worked under the name of the Caucasian Copper Co. Later, after the Batumi Treaty in 1922, they were reincorporated within our borders and continued to serve men's needs according to the requirements and technology of the times. Still later in 1963 [sic] the deposits were taken in hand by the MTA [Minerals Research and Exploration Agency] for assessment and on the basis of their opinion a joint undertaking was set up between Etibank and an English construction firm under the name of the Turkish Copper Works Establishment in order to work the copper deposits in a rational manner and to establish a modern facility with heavy investment. However due to various impediments which emerged during the war years, the firm was able to fulfill its contract only later and on 25 March 1951 was able to commence blister copper production.

The Turkish Copper Works Establishment was abolished in July 1951 and became an Etibank enterprise and in accordance with Decree 961/11 of 2 May 1951 as of 1 June 1951 was established as the Etibank Limited Liability Murgul Copper Works Establishment with an independent character and nominal capitalization of 20 million TL. The project amount of the facility was 23,308,000 TL and with the mechanization of the open operation, the establishment of the sulfuric acid plant, the naval hav [translation unknown] and flotation facility and other changes the total has reached 96,976,136 TL and current capitalization is 60 million TL.

## Sulfur Dioxide in the Air

The Murgul Copper Works is a lucratively operating unit within the Etibank establishment. This plant, which was formed with the intention of serving all manner of domestic and foreign copper industries has contributed in great measure to the development tempo of our country and today is in the position of reaching the peak of its aims.

The SO<sub>2</sub> gases which have emerged from its chimneys since its establishment to the present day are known to have a direct and indirect effect upon the ecology of the environment and efforts have been made to smooth this over by distributing money in the form of indemnities to the people for damage and loss, however in recent time public opinion has begun to show renewed concern regarding some of the adverse effects observed upon public health and the pathetic condition of Murgul. Concerned organizations and universities have taken the matter in hand and have accelerated research on the region and related matters. These interesting studies have established that the gas has threatened the environment of living things (vegetation, animals, people) in this area.

The fact that the region is very rainy and humid increases the toxic effect of the SO<sub>2</sub> gas even more and the vicinity is full of erosion scars as a result of the destruction of natural vegetation. The fact that the air contains an excessive percentage of sulfur dioxide has caused even the bees, who are sensitive to this gas, to desert their hives and move to other locations. The frightful dimensions which air pollution in Murgul has reached result, on the one hand, from the direct effect of sulfur dioxide and, on the other hand, from the conversion of the gas to sulfuric acid due to the high level of humidity (65 percent) and its consequent damage to vegetation.

## The Animals Are Dying

The adverse effects of sulfur dioxide on animals have been researched by Dr Sahin Akman, one of the professors of the Pharmacology and Toxicology course in the Veterinary Faculty at Ankara University. Examples of grass from Petek village were determined to contain 1.76 grams of sulfuric acid per kilogram, those from Kure 1.78 and from Damar 2.47 grams. Clinical symptoms of the animals taken for study were examined along with their pathological and anatomical maladies.

Furthermore it is reported that animals fed with hay grown in this region quickly weakened and died. A sheep selected for feeding with this hay died 11 days later, and a cow began to grow weak 20 days later and died after 42 days.

Research has also been conducted on the spot in Murgul by universities and other organizations on the subject of health. In accordance with a resolution of the technical committee of the Agency for Coordination of Environmental Problems taken on 22 August 1975 a committee made up of representatives from the Ministry of Health and Social Assistance and the Ministry of Industry and Technology went to the Etibank Murgul Copper Works. The following points were covered in the report prepared by this committee: "Because of the suitability of the installation there is no question of environmental pollution occasioned solely by the flotation facility. The Murgul Copper Works is a very old installation which consists of a melting unit operating with an open system and an H<sub>2</sub>SO<sub>4</sub> (sulfuric acid) unit which employs a very old method using lead chambers. In the smelting unit, because the system is an open one in the grinding stage, dust from the ore is widely dispersed around the area. Moreover, the washing water resulting from the flotation process is discharged directly into the Murgul River without undergoing any cleansing process whatsoever.

Coming to the acid plant there is a question of nitro<sub>2</sub> [sic] gas in addition to the SO<sub>2</sub> escaping in the lead chambers system, which is a very old method.

#### The Activity Must Be Stopped

A measurement taken within 100 meters of the factory resulted in a reading of 550.6 mgr/M<sup>3</sup> for the amount of SO<sub>2</sub> and an amount of particulate of 2.3 mgr/M<sup>3</sup>. According to air quality standards approved by the World Health Organization in 1971 and still accepted as valid, the highest permissible concentrations of SO<sub>2</sub> over a 24 hour period is 150 mgr/M<sup>2</sup> [sic] and for particulate is 75 mgr/M<sup>3</sup>. Taking these values into consideration, the fact that the measurement of SO<sub>2</sub> is far in excess of world standards is one more proof of the seriousness of the situation. Under such circumstances, it is possible to list the measures which must be taken:

1. Activity at the facility must be brought to a halt as an emergency measure;
2. In discussions with the factory authorities, it was learned that the construction of a new sulfuric acid plant has been considered as a measure and a project relating to this has been prepared and submitted to the State Planning Office. However it is impossible that a smelting facility be permitted to operate any longer with an open system and primitive methods which incorporate no control system whatsoever and when one takes into consideration the fact that even if construction should begin immediately it will be 5 years before the sulfuric acid factory will go into production and that at the present daily operating tempo reserves may be exhausted within 15 years then it becomes obvious that there is no need to build a new sulfuric acid plant.

In addition to the above solutions, the fact that the land has become unproductive to the extreme makes it clear that it is necessary to move the township of Goktas from its present location to a more productive area.

Prof Dr Bilgin Timuralt of the teaching staff for the course in internal illnesses of the Medical Faculty in Ataturk University, in a study made in 1975 entitled, "The Effect upon the Workers and Local Population of the Sulfur Dioxide Gas Emitted by the Murgul Copper Mining Factory" proved that more than one-third of the workers in the plant had suffered a decline in their working strength, and that the great majority were ill in varying degrees with pulmonary insufficiency. The researcher also covered the following matters in his report: "As the smoke poisoning continues it creates an obstructive inflammation of the air passages, chronic bronchitis and eventually a swelling of the lungs (emphysema). In Murgul this illness is dangerously widespread."

The report of the researcher is annotated in the following manner: "The final scientific results of the research will be obtained later. However, according to presently available evidence, everyone who is living in this large valley, from newly born infants to the aged, are losing their health as a result of the effect of this gas and are face to face with a very great danger.

"I believe that a solution must be found in all urgency so that those who cannot abandon this ancestral land because of the necessity to earn a living may live healthily. If in spite of all of our warnings this poisoning continues, those technologically responsible shall incur an unbearable degree of guilt."

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TURKEY

MUNICIPALITY IMPLEMENTS NEW PLAN FOR BOSPORUS

Istanbul MILLIYET in Turkish 23 Oct 79 pp 1,12

Text A new plan for the Bosphorus area, approved by the Ministry of Redevelopment and Housing after being prepared by the Greater Istanbul Regulatory Planning Office, has begun to be implemented by the municipality.

According to the new Regional Plan, known by its French appellation of SIT, less construction than in the past will take place from now on. For example, the number of floors allowed in construction in the Tarabya and Kirecburnu areas has been reduced from 3 to 2, while it has been stipulated that only one building, rather than several, may be built in the wooded areas.

A further change brought about by the plan is the withdrawal of permission to directly divide up land within intra-village development areas and green-area construction zones into lots and then build a number of buildings. The new plan prohibits the division of areas of land larger than 2,600 square meters. Meanwhile, the right to carry out construction at points where the land and sea meet has been instituted.

Main Lines

The main lines of the new plan are as follows:

- 1) Over half of the residential development areas in the Ortakoy valley have been converted into green areas; as for areas of construction not converted, the number of floors permitted per building has been reduced from 7 to 2.
- 2) Permission to construct a number of buildings in wooded areas has been eliminated, while permission will be granted for the construction of single buildings.
- 3) In Tarabya, Kirecburnu, and certain other areas, areas which had been marked as intra-village development areas in the former plan have now been changed to green areas, while the permitted number of floors in buildings in these areas has been reduced from 3 to 2.

4) While it had been possible in an earlier plan to directly parcel up intra-village development areas and green residential development areas covering large plots of land and then get permission for construction on the lots thereby obtained, the division of areas larger than 2,600 square meters has been prohibited in the new plan.

Meanwhile, in the event of requests for permission to build a number of buildings on areas of land greater than 2,600 square meters, the condition of drawing up a local construction plan has been imposed.

5) It is proposed that, if wooded sections, stream beds, excursion spots, and recreation areas, collectively termed "green zones", are desired, they be taken over by the government.

6) Great importance is ascribed to tourism in the Bosphorus, and it is suggested that, if necessary, a given neighborhood, or a portion of it (together with its historical surroundings) be taken over by the government.

7) In those areas in the Bosphorus where the land and the sea come together, the possibility of construction right at the water's edge is granted in order to assure the maintenance of the old Bosphorus character.

8) In general, local development plans for the project area which had been approved prior to the new plan have not been nullified; only the size, number, and height of new buildings have been further restricted. According to this new plan, buildings higher than two stories will no longer be able to be built on lots overlooking the sea along the Bosphorus.

9) The 1/2000 scale plans for Bosphorus villages which were prepared by foreigners before 1950 are no longer to be applied. It has instead been stipulated that everyone who engages in construction in these areas adhere to the new plan.

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END